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**Childhood trauma and eating psychopathology: A mediating role for
dissociation and emotion dysregulation?**

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Doctorate in Clinical Psychology

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2012

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Abstract

Objectives: This thesis aimed to investigate whether a history of childhood trauma was indirectly associated with eating psychopathology through mediation by dissociation and/or emotion dysregulation.

Method: Firstly, a systematic review was conducted to appraise the current level of evidence within the literature that supported dissociation as a potential mediator. To this end, studies that assessed the variables of childhood trauma, dissociation and eating psychopathology within a single study were identified and systematically reviewed. Secondly, an empirical cross-sectional study was undertaken to investigate a multiple mediation model of the association between childhood trauma and eating psychopathology which included dissociation and emotion dysregulation as potential mediators. 165 undergraduate Psychology students took part in this study.

Participants completed measures of childhood trauma, eating psychopathology, dissociation and emotion dysregulation. Experiences of multiple forms of childhood trauma were assessed, including emotional abuse (CEA), physical abuse (CPA), sexual abuse (CSA), emotional neglect (CEN) and physical neglect (CPN).

Results: The results of the systematic review were inconclusive regarding the potential role of dissociation as a mediator in the relationships between childhood trauma and eating psychopathology. Findings within the reviewed studies generally offered more support for associations between childhood trauma and dissociation and dissociation and eating psychopathology. Studies reported more inconsistent findings regarding the association between childhood trauma and eating psychopathology.

The results from the empirical study indicated that CEA and CEN were both

significantly associated with increased eating psychopathology within the whole sample. These relationships were significantly mediated by both dissociation and emotion dysregulation. A separate analysis with female participants only, indicated that CPA and CPN in addition to CEA and CEN were significantly associated with increased eating psychopathology. The associations between CEA, CEN, CPN and eating psychopathology were all significantly mediated by both dissociation and emotion dysregulation. Dissociation and emotion dysregulation did not mediate the association between CPA and eating psychopathology.

Conclusions: The studies included within the systematic review offered tentative support for an indirect relationship between childhood trauma and eating psychopathology through dissociation. Firm conclusions were limited, however, due to a number of methodological shortcomings identified within the included studies. The main methodological shortcomings concerned the definition and measurement of childhood trauma and the failure of a number of studies to address theoretical models within their research design. Addressing both of these methodological limitations, the results of the empirical study provided support for the growing consensus that emotional maltreatment may be an important risk factor for the development of eating psychopathology. Further, the results of this study indicate that childhood trauma impacts indirectly on eating psychopathology through an enduring effect on both dissociative and emotion regulation processes.

Chapter 1: Introduction

1.1. Background to Thesis

Eating disorders are serious and commonly chronic psychiatric disorders that impact significantly on the individual's physical health and social functioning. Eating disorders frequently prove a great challenge to clinicians in relation to effective treatment. Anorexia Nervosa (AN) is characterised by a marked inability to maintain a normal healthy weight (Berkman *et al.*, 2007). Bulimia Nervosa is characterised by repeated episodes of binge eating and potentially harmful compensatory behaviours including purging or over exercising (Berkman *et al.*, 2007). Research within the last three decades has contributed to the understanding of relevant aetiological and maintaining factors within eating disorders. The literature indicates that eating disorders result from multiple risk factors including, biological, familial, sociological and psychological variables (Fairburn & Harrison, 2003). While risk factors such as body dissatisfaction and low self-esteem appear to be more established within the literature, there remains a clear gap in our understanding of the aetiological influences on the development of eating disorders (Polivy & Herman, 2002). Further, Fairburn and Harrison (2003) discuss that very little is known about how the individual processes interact and vary across the development and maintenance of the eating disorder.

Identifying the factors that predispose and maintain eating disorders is of great importance to clinical practice. Individuals with eating disorders are at increased risk

of mortality due to physical health reasons and are also a high-risk group for suicide (Herzog *et al.*, 2000). Identifying relevant predisposing and maintaining factors for eating disorders is therefore important for informing effective long-term treatment. A recent systematic review of studies investigating treatment of BN, concluded that Cognitive Behavioural Therapy (CBT) is effective at reducing the behavioural and psychological features of BN (Shapiro *et al.*, 2007). However, a systematic review published the same year of studies investigating the treatment of AN concluded that evidence for the effective psychological treatment of AN is weak (Bulik *et al.*, 2007). Reflecting the evidence base, current NICE guidelines recommend that CBT should be offered to individuals with BN but no single evidence-based treatment is recommended for AN (NICE, 2004). Further, for BN patients who do not respond to CBT, current literature has highlighted that evidence based guidelines cannot currently be formulated (Fairburn & Harrison, 2003; Mitchell *et al.*, 2002). Relapse is also a significant problem in the treatment of both BN and AN (Keel *et al.*, 2005).

Although research has tended to investigate risk factors and treatment outcomes separately for AN and BN, it is highlighted that many individuals seeking help with eating difficulties do not meet full diagnostic criteria for either BN or AN (Fairburn *et al.*, 2007). In fact, eating disorder not otherwise specified (EDNOS) is the most prevalent form of eating disorder diagnosis encountered within clinical settings (Fairburn *et al.*, 2007). Further, research suggests that individuals commonly move between eating disorder diagnoses (Milos *et al.*, 2005). Fairburn *et al.* (2003) have therefore proposed that the core elements of eating disorders are effectively the same independent of diagnostic category (AN, BN or EDNOS). Specifically, individuals

with an eating disorder over-evaluate shape, weight and the control of eating. Using the Eating Disorders Examination-Questionnaire (EDE-Q; Fairburn & Beglin, 1994) a number of studies have reported that these core elements are apparent within nonclinical groups including undergraduate student samples (Lavender *et al.*, 2010; Luce & Crowther, 1999). In summary, the literature suggests that investigating potential predisposing and maintaining factors that may be relevant to the proposed core components of eating disorders is important to further develop effective evidence-based treatments.

A potential risk factor that has received significant research interest is childhood sexual abuse (CSA). Case studies in the 1980s (e.g. Goldfarb, 1987; Sloan & Leichner, 1986) suggested a relationship between CSA and both AN and BN. Research interest continued to grow and a series of reviews in the 1990s (Connors & Morse, 1993; Everill & Waller, 1995; Pope Jr & Hudson, 1992; Wonderlich *et al.*, 1997) attempted to establish whether CSA has a causal impact on the development of eating disorders or eating psychopathology. Reviewers such as Connors and Morse (1993) identified a number of methodological difficulties including the definition and measurement of CSA. Reviewers also highlighted that the prevalence rates of CSA within the reviewed studies was equivalent to that observed within other psychiatric groups (Connors & Morse, 1993; Pope Jr & Hudson, 1992). These reviewers therefore concluded that CSA did not represent a specific risk factor for eating disorders. A later review, however, concluded that it was too premature to rule CSA out as a risk factor for BN (Wonderlich *et al.*, 1997).

Researchers continued to investigate the association between CSA and eating disorders and a meta-analysis by Smolak and Murnen (2002) concluded that there was a small, but significant, relationship between CSA and eating disorders. In an update of the Wonderlich *et al.* (1997) review, however, Thompson and Wonderlich (2004) concluded that, while CSA is statistically associated with eating psychopathology, CSA cannot be established as a causal risk factor for eating disorders at present.

Researchers have also investigated the potential role that other forms of childhood trauma may have in the aetiology of eating psychopathology. Childhood physical abuse (CPA) in particular has received significant research interest. For example Rorty *et al.*, (1994) compared female participants with BN to an aged matched control group and found that women with BN reported significantly higher levels of CPA. This association was investigated in nonclinical samples also. For example, Reto *et al.* (1993) found a significant association between CPA and eating psychopathology of the bulimic subtype. Reviewing the literature, however, Kent *et al.* (1999) criticised the research focus on CSA and CPA and recommended that other forms of childhood trauma such as childhood emotional abuse (CEA) and neglect should be investigated also. A number of more recent studies have indeed found an association between CEA, childhood emotional neglect (CEN) and childhood physical neglect and eating psychopathology (Gerke *et al.*, 2006; Kong & Bernstein, 2009). However, further research regarding the association between CEA, CEN and CPN and eating psychopathology is required (Burns *et al.*, 2012).

Despite the observed associations between the different forms of childhood trauma and eating psychopathology, a causal link is yet to be established. At present, researchers generally conclude that the role of childhood trauma in the development of eating psychopathology is complex and likely impacts on eating psychopathology indirectly (Kent *et al.*, 1999; Smolak & Levine, 2007). Researchers have therefore changed their focus to identifying the possible psychological mechanisms by which the form of childhood trauma may impact on the subsequent development of eating psychopathology.

In search of potential mediators in the association between childhood trauma and eating psychopathology, researchers have considered a number of variables that relate to both developmental processes as well as trauma responses. One of the first proposed variables considered was dissociation, a variable that comprises of absorption, amnesia, derealisation and depersonalisation (Everill & Waller, 1995). Studies have reported that dissociation is significantly associated with eating disorders (Schumaker *et al.*, 1994), developmental processes (Putnam, 1997) and experiences of childhood trauma (van der Kolk *et al.*, 2005). A few studies have therefore assessed the mediation effect of dissociation in the relationship between childhood trauma and eating psychopathology. Although some studies offer some support for this role (Everill *et al.*, 1995; Kent *et al.*, 1999), others do not (Gerke *et al.*, 2006; Reto *et al.*, 1993).

Another variable that appears theoretically relevant is emotion regulation. This variable is considered to consist of a number of components including, having an

awareness and understanding of one's emotions, being able to accept emotional distress, and the ability to engage in purposeful activity while experiencing emotion (Gratz & Roemer, 2004). Emotion regulation typically develops through attachment with a caregiver (Mikulincer & Shaver, 2008) and childhood trauma has been found to be associated with emotion dysregulation (Gratz *et al.*, 2007). Research has reported that suppression or avoidance of emotion in eating disorders might be achieved by bingeing and purging (Cooper *et al.*, 2004) or by using behaviours such as exercise and food restriction (Waller *et al.*, 2007). For example, both individuals with BN and AN have reported qualitatively that an 'advantage' of their eating disorder is that it helps them to stifle their emotions (Gale *et al.*, 2006). Only one study to date has investigated emotion dysregulation as a mediator between childhood trauma and eating psychopathology (Burns *et al.*, 2012). Burns *et al.* found that emotion dysregulation was a significant mediator between CEA and eating psychopathology within a female student sample.

1.2 Shortcomings in the Literature

There would appear to be a number of shortcomings within the literature investigating associations between forms of childhood trauma, eating psychopathology and the variables that potentially mediate this association. As discussed, criticism has surrounded the tendency of studies to focus on CSA and/or CPA and not investigate the full range of traumatic experiences (Kent *et al.*, 1999). Variability between studies in terms of the type of eating psychopathology assessed has also been highlighted as a potential difficulty (Gerke *et al.*, 2006). Different

findings between studies investigating restrictive eating psychopathology and studies investigating bulimic eating psychopathology would be such an example (Thompson & Wonderlich, 2004). Childhood trauma has also been defined differently within the literature (Herzog *et al.*, 1993). Such methodological shortcomings may be relevant to explaining the mixed findings regarding the potential mediating role of dissociation. A further criticism concerns the different ways that trauma, dissociation and eating psychopathology have been assessed within the literature. Potential differences exist between studies assessing prevalence versus severity of these variables as well as the validity of the various assessment measures used (Hartt & Waller, 2002). Finally, Kent *et al.* (1999) recommend that, as dissociation is unlikely to be the only potential mediator in the relationship between childhood trauma and eating psychopathology, studies should assess other theoretically relevant variables as potential mediators alongside dissociation.

1.3 Conclusions

Altogether, both reviews and empirical studies conclude that the association between childhood trauma and eating psychopathology is indirect. That is, childhood trauma is a non-specific risk factor for the development of subsequent eating psychopathology. It is clear that the potential mechanisms that mediate this relationship need further research. Consequently, to date, there is no empirically validated model that explains the association between childhood trauma and eating psychopathology. It would appear that both dissociation and emotion dysregulation are theoretically relevant potential mediators in this relationship. Only one study to

date has investigated emotion dysregulation as a potential mediator. Further, the few studies that have investigated dissociation as a potential mediator have reported mixed findings. The potential mediation effects of these variables require further investigation.

1.4 Aims and Overview of the Thesis

1.4.1 Thesis Aims

The overall aim of the thesis was to gain a greater understanding regarding the potential mediation effects of dissociation and emotion dysregulation in the relationship between childhood trauma and eating psychopathology. The first aim was to systematically review the literature to determine whether dissociation remained a plausible mediator in this relationship and attempt to account for the mixed findings observed within the literature. The second aim of the thesis was to test a theory driven multiple mediation model of the association between childhood trauma and eating psychopathology involving the mediators of dissociation and emotion dysregulation.

1.4.2 Thesis Overview

Chapter Two focuses on the role of dissociation as a potential mediator in the relationship between childhood trauma and eating psychopathology. A systematic review of the relevant literature was undertaken within this chapter. This review was written up according to the author submission guidelines for the International Journal of Eating Disorders. Reviewing the literature suggested that only a few studies had

investigated the mediation effect of dissociation using mediation analysis. Therefore, to gain a greater understanding of the relationships between childhood trauma, dissociation and eating psychopathology, studies that had investigated the three variables within an empirical study were subject to systematic review. This chapter draws conclusions regarding the potential role of dissociation as a mediator and highlights methodological shortcomings within the literature. Consideration is given as to how these shortcomings could be addressed within future studies.

Chapter Three provides a full methodological overview of the empirical study described in Chapter Four. Evidence is provided regarding the validity and reliability of the chosen measures as well as the appropriateness for use within the study. The ethical considerations of the study are also fully discussed.

Chapter Four presents the findings from the empirical study which tested a multiple mediation model of the association between childhood trauma and eating psychopathology involving the mediators of dissociation and emotion dysregulation. This study was written up according to the author submission guidelines for *Child Abuse & Neglect: The International Journal*. To investigate whether there was support for this model, it was tested in a nonclinical sample of undergraduate students. Multiple forms of childhood trauma were assessed as well as a measure of eating psychopathology that included the core components thought to be relevant to eating disorders. A discussion of the findings is provided within this chapter. The discussion draws conclusions regarding the potential underlying mechanisms within

the relationship between childhood trauma and eating psychopathology in relation to the study's findings and considers directions for future research.

Chapter 2: Systematic Review

2.1 Title Page

To what extent does dissociation explain the relationship between childhood trauma and eating psychopathology? A systematic review of studies investigating all three variables

(Written in accordance with the author submission guidelines for International Journal of Eating Disorders, see Appendix 1)

Short title for running head: TRAUMA, DISSOCIATION AND EATING
PSYCHOPATHOLOGY

2.2 Abstract

Objective: This review aims to investigate the evidence for dissociation as a potential mediator within the relationship between childhood trauma and eating psychopathology.

Method: Studies that assessed the variables of childhood trauma, dissociation and eating psychopathology within a single study were identified through searching electronic databases and manual searches of reference lists and relevant journals. 20 studies were included in this review.

Results: Only 6 of the included studies assessed for a mediation effect of dissociation using mediation analysis with 3 finding support. Studies generally reported more support for relationships between childhood trauma and dissociation and between dissociation and eating psychopathology than between childhood trauma and eating psychopathology.

Conclusion: A number of methodological difficulties were observed which limit the conclusions that can be drawn. The main methodological issues concerned the definition and measurement of childhood trauma and the failure of a number of studies to address theoretical models within their research designs.

Recommendations are offered for future research.

Keywords: Child abuse; childhood trauma; dissociation; anorexia nervosa, bulimia nervosa, binge eating disorder; eating disorders; eating psychopathology; eating pathology; binge; purge; systematic review

2.3 Introduction

Research over the past thirty years has indicated that childhood abuse has a broad range of psychological sequelae. Large community sample studies completed in a number of countries have reported that childhood sexual abuse is associated with anxiety, depression, anger, aggression, post-traumatic stress, self-injurious behaviour, sexual dysfunction, substance abuse disorders, borderline personality disorder and somatisation disorders.¹⁻⁴ Further research has also indicated that childhood physical abuse has a similar psychological sequelae to childhood sexual abuse.^{5,6}

Estimates regarding the prevalence of childhood abuse in the general population vary widely within the literature. It is likely that variation in estimations reflect the difference in the studies in terms of the definition of abuse used, survey methods and the representativeness of the samples recruited.⁵ A review that attempted to synthesise the findings of 16 cross sectional community sample surveys conducted in North America by adjusting for differences in response rates and definitions of abuse within the studies estimated the prevalence of childhood sexual abuse as 16.8% for females and 7.9% for males.⁷ Outside of North America, a review of general population studies in 19 further countries estimated prevalence rates of childhood sexual abuse as ranging from 7% to 36% for females and 3% to 29% for males.⁸ Studies in the United Kingdom estimate that around 10% of females and

males have experienced childhood sexual abuse and 7% have experienced childhood physical abuse.⁹

Research in the field of eating disorders has been heavily influenced by the potential etiological role of a history of childhood abuse in the development of eating psychopathology.¹⁰ Studies attempting to assess the impact of childhood abuse and the subsequent development of eating psychopathology have mainly focused on childhood sexual abuse (CSA) and, to a lesser extent, childhood physical abuse (CPA).¹¹

Studies investigating the prevalence rates of CSA in eating disorder samples indicate that approximately 30% of individuals with an eating disorder will report a history of CSA.^{12,13} Compelling as this estimate may seem, it has been highlighted that this figure is comparable to rates found within other psychiatric populations and in the general population.¹² Nevertheless, individual studies have found some support for the association between CSA and eating psychopathology¹⁴⁻¹⁶ and a meta-analysis¹⁷ reported a small, but significant, relationship between CSA and later development of Anorexia Nervosa, Bulimia Nervosa and Binge Eating Disorder.

Although CSA has attracted more investigation than CPA, studies have also offered some support for an association between CPA and development of eating psychopathology.¹⁸⁻²⁰ One study investigating both CSA and CPA found that CPA was the stronger predictor of eating psychopathology.²¹ Despite the fact that CSA and CPA have been found to be independently associated with heightened risk of

developing eating psychopathology,²² CSA and CPA are unlikely to have occurred in isolation of each other.² Indeed support for a cumulative impact of abuse (i.e. the more forms of abuse suffered, the greater the psychological impact) has been documented in individuals with eating psychopathology.²⁰ The impact of childhood emotional abuse (CEA) and childhood neglect has not received the same attention as CSA and CPA until recently within eating disorder research,²³ which likely reflects the greater focus on CSA and CPA within the larger child maltreatment research literature. Nevertheless, research has offered further support for an association between CEA and eating psychopathology.²⁴⁻²⁹

Despite research linking the adverse effects of childhood trauma with eating psychopathology, the existence of a causal link between the two has been the subject of debate.^{12,13,30} A review investigating the contribution of CSA to eating psychopathology, noted that there was stronger evidence for an association between CSA and bulimic symptomatology than restrictive anorexia.³⁰ Two review articles^{31,32} concluded that, while CSA may represent a risk factor for eating psychopathology (particularly bulimic symptomatology), CSA does not represent a specific risk factor for eating psychopathology. Support for this argument is found in research documenting that childhood trauma (especially CSA and CPA) as well as, in more recent years, CEA and neglect continue to be associated with a number of psychiatric disorders as well as eating disorders.³³

Consistent with the available evidence, it is asserted that the role of childhood trauma in the development of eating psychopathology is extremely complex and likely

impacts on eating psychopathology indirectly. Childhood abuse may impact on an individual's psychological processes predisposing him to the susceptibility of developing eating psychopathology if other etiological factors are in place.¹¹

To explore the nature of this complex association and uncover potential mediators of the relationship, it is suggested that researchers consider the function that eating psychopathology may serve for those who have experienced childhood trauma, in particular dissociation (comprising of absorption, amnesia, derealisation and depersonalisation).³⁰ Dissociation has long been considered a natural defence mechanism for escaping emotional distress that is deemed unbearable by the sufferer.³⁴ Some authors have argued that dissociation is a central component of posttraumatic stress.³⁵ A recent review paper noted that dissociation appears to be strongly associated with self-reported trauma including CSA and CPA.³⁴ It should be noted, however, that not all children who have been abused develop clinically significant levels of dissociation.³⁶ It has been highlighted that prospective longitudinal studies are required to assess the relationship between childhood abuse and dissociative symptoms further.³⁶ Difficulties have also been reported within the literature in determining what should constitute as pathological levels of dissociation in children.³⁷ It is therefore difficult to determine prevalence rates of dissociative symptoms in children who have been abused.

Studies of dissociation in children have only recently become feasible since the development of reliable measures specific to the assessment of children.³⁸ Studies that have recruited abused and non-abused preschool children have reported that

children who have been sexually abused, physically abused and neglected demonstrate greater levels of dissociation than non-abused children.^{36,39} The latter study found that around 17% of abused children reported dissociative symptoms that were within the clinically significant range; whereas none of the non-abused children scored within this range.³⁹

An association between dissociation and eating psychopathology has been reported in a number of studies.^{40,41} Further, patients with an eating disorder who report childhood abuse tend to report higher levels of dissociation than those who do not report abuse and dissociation, as with reported CSA, appears to be more prevalent in individuals with higher levels of bulimic symptomatology.¹⁰

Dissociation has been reported to be associated with a number of other maladaptive behaviours including self-injurious behaviour⁴² and substance abuse.⁴³ Individuals who report childhood trauma and eating psychopathology would also seem to be at higher risk of experiencing difficulties with substance abuse⁴⁴ and self-injurious behaviour.⁴⁵ It has been argued that all of these behaviours, including eating psychopathology, may be activated through developmental processes as means of coping with the emotional consequences of childhood trauma.⁴⁶ In support of this argument, a number of researchers have found support that bingeing and purging may serve to bring about a state of dissociation.^{47,48}

However, studies that have investigated dissociation as a mediator in the relationship between childhood trauma and eating psychopathology tend to focus on CSA and/or

CPA and not investigate a full range of traumatic experiences¹¹ There is also variability between studies in terms of the type of eating psychopathology assessed,²⁸ the way in which childhood trauma is defined⁴⁹ and the different ways in which trauma, dissociation and eating psychopathology are assessed within the literature.⁵⁰

In summary, the literature indicates that investigating potential psychological mediators in the relationship between childhood trauma and eating psychopathology is important.⁵¹ The aim of the current review was therefore to systematically review the evidence for the mediating role of dissociation in the relationship between childhood trauma and eating psychopathology, focusing on studies that have investigated dissociation, childhood trauma and eating psychopathology within a single study.

2.4 Method

2.4.1 Inclusion and Exclusion Criteria

Addressing the extent to which a variable mediates the relationship between two variables can be investigated using mediation analysis. Different methodological approaches for investigating mediation have been suggested.⁵² Hayes⁵³ states that the most widely used method is the one outlined by Baron and Kenny.⁵⁴ Investigating the role of a potential mediator using this approach involves assessing the relationship between the independent variable (IV) and the dependent variable (DV), the independent variable and the mediator (M) and between M and DV. The

assessment of dissociation as a mediator, using this approach, would involve assessing the relationships between the following variables: childhood trauma (IV) and eating psychopathology (DV), childhood trauma (IV) and dissociation (M), dissociation (M) and eating psychopathology (DV).

Ideally, this review would address only studies that have investigated dissociation as a mediator using a mediation analysis; however, mediators in the childhood trauma and eating psychopathology relationship are under investigated.⁵¹ Therefore, this review has taken a broader consideration of methodological designs in order to investigate the extent that dissociation may account for the relationship between childhood trauma and eating psychopathology.

Studies were eligible for inclusion if they (i) investigated the variables of childhood trauma, dissociation and eating psychopathology within an adult sample and (ii) assessed at least two relationships between these variables or conducted a full mediational analysis using all three variables. Studies that assessed all three variables but only reported the results for one relationship (e.g. dissociation and eating psychopathology only) were excluded. Studies where all of the relevant variables were not assessed at the same time (e.g. eating psychopathology assessed pre-intervention only and dissociation assessed post-intervention only) were also excluded. Cohort, case-control and case series study designs were all eligible for inclusion. Case studies were not considered within this review.

There has been some uncertainty as to what should constitute as childhood trauma within the literature.⁵⁵ There is consensus within the literature that this term is used to describe experiences of abuse and neglect suffered in an individual's childhood.⁵⁶ However, defining what constitutes as abuse or neglect is difficult due to cultural influences on acceptable parenting.⁵⁷ It is also unclear whether abuse and neglect should be conceptualised according to the frequency, severity or duration of the abuse or neglect simply by a single event of abuse or neglect having occurred.⁵⁵ A measure with excellent reliability as well as convergent and discriminant validity that is used widely within the childhood trauma research, is the Childhood Trauma Questionnaire (CTQ).⁵⁸ This measure attempts to address deficiencies within the childhood trauma literature and defines childhood trauma as consisting of physical, sexual and emotional abuse as well as emotional and physical neglect.⁵⁸ The measure is consistent with the World Health Organization (WHO) and International Society for Prevention of Child Abuse and Neglect (ISPCAN) definition of childhood maltreatment.⁵⁹ According to the definition outlined in these guidelines, the maltreatment must have occurred within the individual's first 18-years-of-life to be defined as childhood maltreatment.

Within this review, studies that reported assessing for any one or more of the forms of abuse or neglect defined as a form of childhood trauma by the CTQ and the WHO and ISPCAN (that is; physical abuse, sexual abuse, emotional abuse, emotional neglect and physical neglect), that were said to have occurred during childhood were accepted as having assessed for childhood trauma. The form of childhood trauma within this review was defined by the description used within the individual studies.

Providing the form of childhood trauma was one of the above forms and was reported to have occurred during childhood, the form of childhood trauma was not further defined according to a more specific criteria (e.g. severity or frequency of abuse).

Dissociation has also been defined somewhat variably within the literature.⁶⁰

However the development of reliable and valid measures of dissociation has improved how this construct is defined.⁶¹ Within this review, studies that reported measuring dissociation using a published measure of dissociation were accepted as having assessed for dissociation.

Studies were accepted as having investigated eating psychopathology if it was assessed using a measure of eating psychopathology with a clinical or non-clinical sample or the study investigated the variables of childhood trauma and dissociation within an eating disorder sample or between individuals with and without a diagnosed eating disorder.

In this review, a sample was defined as individuals with an eating disorder (ED) if the participants were recruited following contact with an eating disorder service and had received a diagnosis of eating disorder from a qualified health professional. A sample was defined as a non-eating disorder (non-ED) sample if the individuals assessed were not recruited through contact with eating disorder services. Such samples could potentially include student samples, community samples and

individuals receiving treatment for other mental health related difficulties than eating psychopathology.

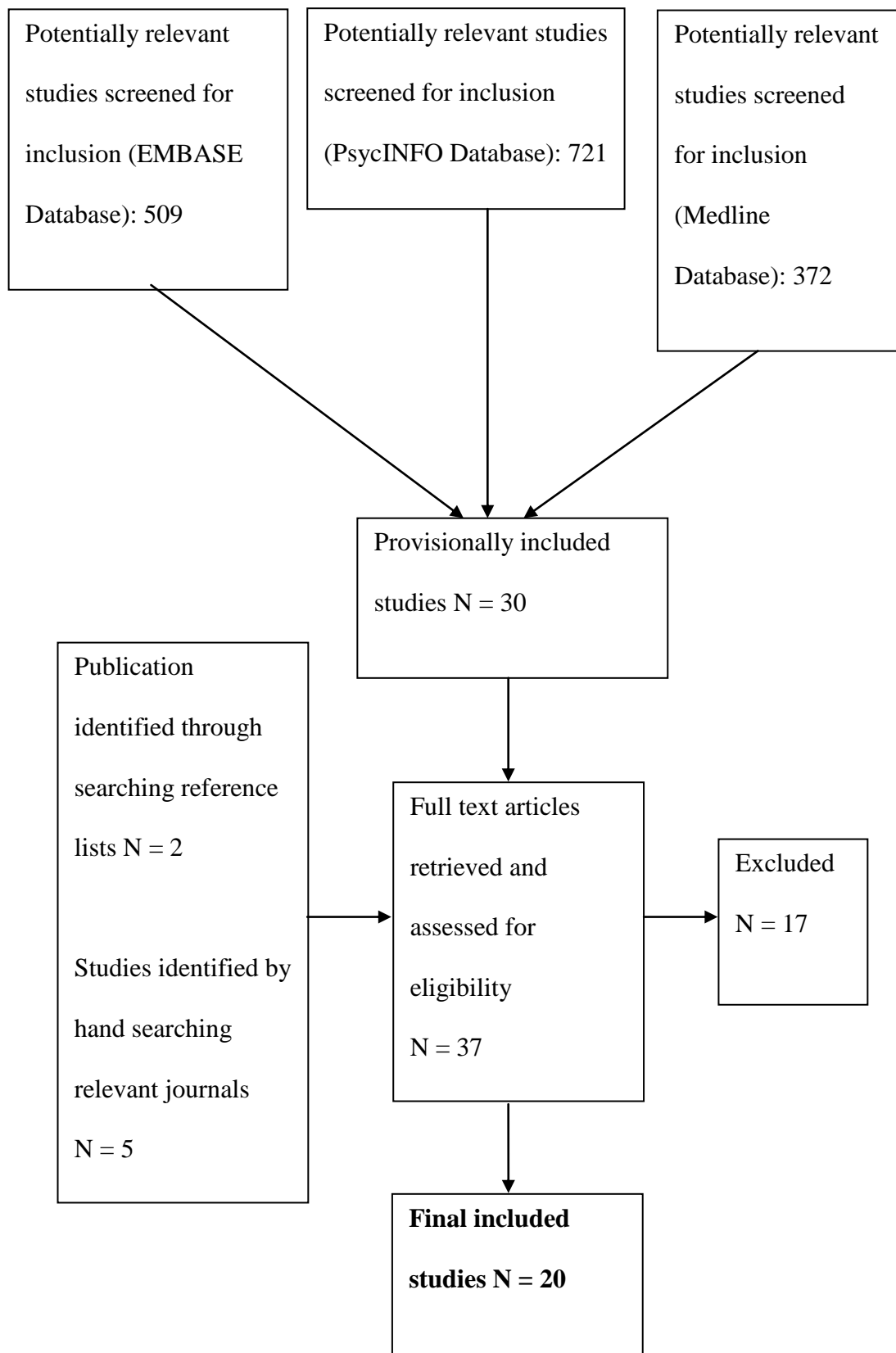
2.4.2 Literature Search

Searches were limited to studies published in English language peer-reviewed journals due to lack of feasibility for translation of texts. An initial literature search was conducted using The Cochrane Database of Abstracts of Reviews of Effects (DARE) in November 2011 to confirm whether a similar review had been performed. The following search string was used: ('child\$ abuse' OR 'child\$ sexual abuse' OR 'child\$ physical abuse' OR 'child\$ emotional abuse' OR 'child\$ neglect' OR 'trauma' OR 'dissociation' OR 'dissociative') AND ('eating disorder\$' OR 'anorexia nervosa' OR 'bulimia nervosa' OR 'EDNOS' OR 'binge eating'). This search did not reveal any reviews addressing the same research question.

In January 2012, using the above search string for each, the following electronic databases were searched: EMBASE (1990-2012); PsycINFO (1990-2012); and Medline (1990-2012). Using this search string resulted in 509 articles being retrieved by EMBASE, 721 being retrieved by PsycINFO and 373 being retrieved by Medline. The search was re-run in October 2012 using 'AND' in the search string instead of 'OR' with no further articles being returned. All returned articles were initially screened to assess their suitability using the above inclusion criteria by reviewing the titles and abstracts of the papers. This resulted in the provisional inclusion of 30 studies. Relevant journals within the years 2002-2012 were searched: Child Abuse & Neglect, Eating Disorders, International Journal of Eating Disorders and Journal of

Trauma & Dissociation. This resulted in identification of a further 2 articles. Finally, the reference lists of the provisionally included articles were manually searched. This search resulted in the identification of 5 further articles for provisional inclusion, taking the total up to 37. Fuller examination of these full-text articles resulted in 17 articles being excluded as they did not meet the inclusion criteria. Therefore this review article was based on the remaining 20 studies. A flowchart diagram of this literature search process is illustrated in Figure 1.

Figure 1. Flowchart detailing literature search process.



2.4.3 Quality Criteria

Existing guidelines for appraising research have been primarily developed for studies utilising randomised control trial methodology.⁶²⁻⁶⁵ Consequently, much of the guidance offered for quality assessment within these frameworks was not relevant to the current review. Quality criteria that were thought to be relevant and applicable for this specific review were therefore developed. This encompassed 14 criteria identified a priori based on the Centre for Reviews and Dissemination (CRD) quality criteria, SIGN methodology guidelines and criteria identified as relevant by the authors. These were:

- The rationale for investigating ED Psychopathology, CT and dissociation is clearly discussed for all three variables.
- The sample is well described.
- If a control group is used, they are selected from source populations that are comparable in all respects other than the factors under investigation.
- If individuals are classified as having an eating disorder or significant ED psychopathology, the classification procedure is internationally recognised, standardized or replicable.
- The study indicates how many of the people asked to take part in the study did so, in each of the groups being studied.
- Attrition in each of the groups being studied is reported (the number of participants assessed for each analysis is detailed).

- Childhood Trauma assessed within the study is either one or more of the following: CPA, CSA, CEA, childhood emotional neglect (CEN), childhood physical neglect (CPN) occurring before the age of 18-years.
- Reliability and validity of eating psychopathology measure.
- Reliability and validity of dissociation measure.
- Reliability and validity of childhood trauma measure.
- Statistical power of the study is addressed.
- Different types of childhood trauma assessed in study analysed separately? (Literature reviewed above suggests different types of abuse/neglect likely related but relevance of each to eating psychopathology should be investigated).
- The study tests a theory driven model involving all three variables
- Generalisability of findings (i.e. generalisability, limitations and implications are clearly discussed).

The 14 quality criteria were assessed using the criterion ratings used in the SIGN methodology guidance. Each study was assessed by the first author on each quality criterion using the following outcome ratings: ‘well-covered’ (3 points), ‘adequately addressed’ (2 points), ‘poorly addressed’ (1 point), and ‘not addressed’ and ‘not applicable’ (both 0 points). A second rater independently reviewed 5 of the studies using the above criteria and outcome ratings. There was good overall agreement between the raters with exact agreement between the raters for 84.3% (59/70) of the criteria. The raters differed by one point only (e.g. well-covered versus adequately addressed) on all of the 11 discrepancies.

2.5 Results

2.5.1 Data Synthesis

As a result of the diversity of the samples included, range of methodology employed and the different ways the variables were measured, quantitative data synthesis (meta-analysis) was not considered appropriate. The characteristics and the findings of the studies are presented in Table 1. The studies are separated by sample (ED or Non-ED with/without a control group) and number of relationships assessed to allow comparison between studies of most similar design.

2.5.2 Quality of Included Studies

Table 2 provides ratings for each of the studies on the 14 quality criteria. The rating scale does not provide an exact comparative measure across studies (e.g. not all studies employed a control group). Nevertheless, the rating scale provides a guide to the study's relative methodological strengths and weaknesses. Only one study²⁸ reported information regarding the reliability and validity of all the measures used. Therefore, where the psychometric properties were reported within the wider literature, the quality ratings were based upon these properties.

2.5.3 Characteristics of Included Studies

All of the 20 studies reviewed were cross-sectional designs. All assessed dissociation and childhood trauma in relation to eating psychopathology at a single time point.

10 studies recruited individuals with an eating disorder to investigate the relationships between the different variables. Of these, 7 of the studies recruited individuals presenting with various eating disorder diagnoses, 2 recruited individuals presenting with Bulimia Nervosa only and 1 recruited individuals with Binge Eating Disorder (BED). In the samples considered non-ED (10 studies), 7 studies recruited student samples, 1 recruited from a university campus sample (open to staff members too) and 1 recruited from a psychiatric inpatient setting. Only 5 studies recruited male participants.

19 studies assessed for childhood sexual abuse, 12 assessed for childhood physical abuse, 6 assessed for childhood emotional abuse (defined as psychological abuse in 3 studies and emotional maltreatment in 1 study) and 3 assessed for neglect (defined as childhood neglect in 2 studies and separated into physical and emotional neglect in 1 study).

2.5.4 Summary of the Main Findings

ED sample and non-ED samples assessing 2 or 3 relationships. The 7 studies grouped under these categories in Table 1^{21,47,66-70} assessed the three variables within

a single sample. 2 studies used Non-ED samples.^{69,70} 3 studies investigated CSA only^{47,69,70} and 4 studies investigated CSA and CPA^{21,66-68}.

Childhood trauma and eating psychopathology:

4 studies investigated a relationship involving childhood trauma and eating psychopathology. 2 studies assessed this relationship using correlational analysis^{68,70} with one reporting a significant positive association.⁷⁰ 2 studies found that participants reporting childhood trauma did not report significantly more eating psychopathology than participants reporting no childhood trauma.^{67,69}

Childhood trauma and dissociation:

All 7 studies looked at a potential relationship between childhood trauma and dissociation. 3 studies assessed this relationship using correlational analysis,^{21,69,70} with all three finding support for a positive association between childhood trauma and dissociation. 4 studies compared individuals reporting childhood trauma with individuals reporting no childhood trauma.^{47,66-68} Only one study did not find that those reporting childhood trauma did not report significantly more dissociation than those reporting no childhood trauma.⁶⁷

Dissociation and eating psychopathology:

6 studies investigated a potential relationship between dissociation and eating psychopathology.^{21,47,66-70} 2 studies reported a significant positive association between dissociation and eating psychopathology^{21,70} while 2 studies found no significant association.^{66,68} One study found that significantly more dissociation was reported by individuals who scored in the upper range on the eating psychopathology

measure.⁶⁹ Finally one study found that participants reported levels of dissociation were significantly higher during episodes of bingeing and purging than during non-bingeing and purging times.⁴⁷

In summary, the findings within these reviewed studies do not offer support for a relationship between childhood trauma (encompassing CSA and CPA only) and eating psychopathology. More support for a relationship between childhood trauma and dissociation and between dissociation and eating psychopathology was found within the studies.

ED sample and control group/Non-ED sample with significant eating psychopathology and control group assessing relationships between and within groups. The 7 studies grouped under these categories in Table 1,⁷¹⁻⁷⁷ assessed the three variables employing a control group and with individuals with an eating disorder or with individuals without a diagnosed eating disorder reporting significant eating psychopathology. A wider range of childhood trauma was assessed within these studies. All 7 studies included CSA, 6 further included CPA⁷¹⁻⁷⁶, 4 further included emotional abuse^{71,73,75,76} and 1 further included physical neglect⁷⁴.

Relationships between the variables were assessed between groups (e.g. ED group versus control) or within groups (e.g. ED group only).

Childhood trauma and eating psychopathology:

3 studies found that participants with a diagnosed eating disorder reported significantly more childhood trauma than participants without a diagnosed eating disorder.⁷³⁻⁷⁵ One study reported that college participants assessed to have significant eating psychopathology reported more episodes of childhood trauma than

participants assessed to have non-significant eating psychopathology.⁷⁷ However, this finding was not replicated in another study.⁷⁶

Childhood trauma and dissociation:

3 studies chose to assess this relationship within the eating disorder group only (relationship not assessed in control group).^{71,72,74} All 3 studies reported that individuals with a diagnosed eating disorder who had also experienced childhood trauma reported significantly greater levels of dissociation than individuals with a diagnosed eating disorder who did not report experiencing childhood trauma. 3 studies chose to assess this relationship within the whole sample.^{73,75,76} In two studies, participants with or without a diagnosed eating disorder who reported childhood trauma scored significantly higher than participants with and without a diagnosed eating disorder who did not report experiencing childhood trauma.^{73,76}

Dissociation and eating psychopathology:

4 studies reported that individuals with a diagnosed eating disorder reported significantly greater levels of dissociation than individuals without a diagnosed eating disorder.^{71,73-75} Two studies compared college participants who either reported significant eating psychopathology or not.^{76,77} Those reporting significant eating psychopathology reported significantly higher levels of dissociation in one study only.⁷⁷

In summary the findings within these reviewed studies offered more support for a relationship between childhood trauma and eating psychopathology when a fuller range of subtypes of childhood trauma were assessed. The studies offered further

support for a relationship between childhood trauma and dissociation and between dissociation and eating psychopathology.

ED and non-ED sample mediation analysis. Of the 6 studies^{11,18,28,78-80} investigating a potential mediational role for dissociation (see Table 1), all but one recruited a non-ED sample.⁷⁸ 3 studies investigated CSA only^{78,79,80} and 1 study CPA only.¹⁸ 2 studies investigated, CEA and CPN in addition to CSA and CPA.^{11,28} 2 studies appeared to include adult sexual abuse within their definition of CSA.^{78,79}

Childhood trauma and eating psychopathology:

4 studies reported a significant positive association between childhood trauma and eating psychopathology.^{11,18,28,79} 2 studies found that participants reporting a history childhood trauma reported greater eating psychopathology than participants who did not report a history of childhood trauma.^{78,80}

Childhood trauma and dissociation:

4 studies investigated this relationship using correlational analysis^{11,18,28,79} with 3 reporting a significant positive association between childhood trauma and dissociation.^{11,28,79} 2 studies reported that participants with a history of childhood trauma reported greater levels of dissociation than participants without a history of childhood trauma.^{78,80}

Dissociation and eating psychopathology:

All 6 mediation studies used correlational analysis to investigate this relationship with 5 reporting a significant positive association between dissociation and eating psychopathology.^{11,28,78,79,80}

Mediation analysis:

3 of the 6 mediation studies^{11,78,79} found support for dissociation as a mediator of the relationship between childhood trauma and eating psychopathology.

In summary, the findings within these reviewed studies offered support for all three relationships. However, inconclusive support was found regarding the role of dissociation as a mediator in the relationship between childhood trauma and eating psychopathology.

Table 1. Summary of study characteristics and main findings (divided by sample source and relationships assessed between the three variables)

ED sample assessing 2 relationships					
Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
Berger et al. ⁶⁶ Japan	52 women with an ED attending outpatient group. Using DSM-III- R criteria: 44 diagnosed with both AN and BN, 4 BN, 2 AN and 2 EDNOS.	17-33 years (M=24)	EP Measure: BITE Severity Scale CT Measure: Modified self- report version of DDIS Dissociation Measure: DES	CPA & CSA	CT & EP: Relationship not assessed. CT & Dissociation: Participants reporting CPA scored significantly higher on DES than participants that did not report CPA. Result not observed for CSA. Dissociation & EP: No significant correlation between BITE score and DES score.

Table 1. Continued

Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
Favaro et al. ⁶⁷ Italy	155 patients (3 males) with ED referred to two ED units (one in-patient and one out-patient unit) during the same time period. Based on DSM-IV criteria: AN-R (n = 38), AN-BP (n = 48), BN-P (n = 53) or BN-NP (n = 16).	AN: 14- 48 years (M = 23.1; SD = 5.6) BN: 16- 43 years (M = 23.7; SD = 5.1)	EP Measure: EDI CT Measure: DIS-Q check-list Dissociation Measure: DIS-Q	CSA & CPA	CT & EP: No significant difference between participants reporting abuse and those not reporting abuse on EDI measure in sample as a whole. Individuals with AN-BP and BN-P reported frequency of binge-eating and vomiting not significantly higher among participants reporting abuse than participants reporting no abuse. CT & Dissociation: No differences observed between participants reporting abuse and those not reporting abuse on the DIS-Q for the whole sample. Dissociation did not significantly predict abuse in logistic regression analysis. Dissociation & EP: Relationship not assessed.

Table 1. Continued

Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
McCallum et al. ²¹ USA	20 patients from private ED hospital and 18 tertiary care day centre patients. Classified as having symptoms of bulimia (71%), anorexia (21 %) and EDNOS (8%).	19-35 years with median age = 25	EP Measure: Asked about eating difficulties in relation to dissociation CT Measure: Excerpts taken from WSQ used to ask questions about sexual abuse and CPA Dissociation Measure: DES	CSA & CPA	CT & EP: Relationship not assessed. CT & Dissociation: CPA but not CSA associated with DES scores. Dissociation & EP: Participants who reported DES items as occurring greater than 25% of the time asked if they noted a relationship between the phenomena and eating behaviour. 74% (28) of patients reported some association of dissociative symptoms with their specific disordered eating behaviours.

Table 1. Continued

Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
McShane and Zirke ⁴⁷ USA	12 adult females meeting DSM-IV criteria for bulimia who purged primarily by self-induced vomiting.	18-54 years (M = 31.2)	EP Measure: Author administered questionnaire assessing current frequency of bingeing and purging CT Measure: Author administered questionnaire asking about trauma Dissociation Measure: Participant rated items of CADSS	CSA	CADSS completed for each of four specific points in the binge-purge cycle (just before, during, after binge but before purge and just after purge). CT & EP: Relationship not assessed. CT & Dissociation: Participants with a history of CSA reported higher levels of dissociation consistently across all assessments than participants without such a history. Differences did not reach significance. Dissociation & EP: Dissociation scores significantly higher for bingeing/purging times than for non- bingeing/purging times. Dissociation increased through the four stages of the cycle and then dropped after the purge was completed.

Table 1. Continued

ED sample assessing 3 relationships					
Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
McCarthy et al. ⁶⁸ USA	30 participants (29 females) diagnosed with BN using DSM-III-R criteria who were taking part in multicentre drug trial.	M = 28.6 SD = 8.4	EP Measure: binge/purge diary CT Measure: LEQ Dissociation Measure: DES	CSA & CPA	CT & EP: History of CSA or CPA not significantly associated with severity of bingeing behaviour (measured by number of binges per week). CT & Dissociation: Those reporting CPA reported significantly higher DES scores than those who did not report CPA. Result not observed for CSA. Dissociation & EP: DES score not significantly associated with bingeing severity (measured by number of binges per week).

Table 1. Continued

Non-ED sample assessing 3 relationships					
Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
Korte et al. ⁶⁹ USA	391 Undergraduate Students (173 males, 219 females).	18-44 years (M = 20)	EP Measure: BULIT-R CT Measure: Author modified version of the Finkelhor Questionnaire Dissociation Measure: Dissociation subscale of the TCS-40	CSA	CT & EP: No significant difference in bulimic behaviours (as measured by BULIT-R) between participants reporting CSA and those not reporting CSA. CT & Dissociation: Participants reporting CSA scored significantly higher on dissociation measure. Dissociation & EP: Using BULIT-R, 37 of the participants labelled as 'reporting bulimic behaviours'. These participants scored significantly higher on dissociation measure.

Table 1. Continued

Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
Mercado et al. ⁷⁶ Puerto Rico	56 Female inpatients receiving psychiatric and psychological therapy in a unit specialising in major depression. None of the participants ever diagnosed with an ED.	21-39 years (M = 30.88 SD = 5.26)	EP Measure: QES CT Measure: BSAE Dissociation Measure: DES	CSA	CT & EP: Participants reporting CSA scored significantly higher on the QES than participants without a history of CSA. QES scores significantly correlated with history of CSA. CT & Dissociation: DES scores significantly correlated with presence of CSA as well as severity of CSA. Dissociation & EP: DES scores significantly correlated with all three scales of QES.

Table 1. Continued

ED sample and control group assessing 1 relationship between groups and 1 within groups					
Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
Dalle Grave et al. ⁷¹ Italy	ED Psychopathology Group: Female patients diagnosed using DSM-III-R criteria: 30 AN-R, 12 AN-BP and 17 BN. Sample also included 40 obese patients (30 defined as having BED)	AN-R (M = 21.9, SD = 6.0); AN-BP (M = 25, SD = 4.0) ; BN (M = 22.1, SD = 2.9); BED (M = 36.4, SD = 13.2); Obese (M = 40.4,SD = 13.5); Control group (M = 18.1; SD = 0.8)	EP Measure: BITE used to assess AN-B, BN and BED patients only CT Measure: Self-report questionnaire (unspecified) and clinical interview Dissociation Measure: DIS-Q	CSA, CPA, loss of a family member & psychological abuse	CT & EP: Relationship not assessed. CT & Dissociation: (Assessed within ED Psychopathology group only) Patients reporting a history of trauma (trauma variable encompassed 4 trauma types) reported significantly higher total DIS-Q scores Dissociation & EP: (Assessed between groups) ED psychopathology group reported significantly higher DIS-Q total scores than control group.

Table 1. Continued

Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
Nagata et al. ⁷² Japan	ED patient group: 136 female out-patients; 33 AN-R, 40 AN-BP & 63 BN-P Control group: 99 female nursing students	AN-R (M = 22.1, SD = 6.6); AN-BP (M = 25.5, SD = 4.7); BN-P (M = 22.0, SD = 4.1); Control group (M = 20.8, SD = 2.5)	EP Measure: EDI CT Measure: Self- report questionnaire (unspecified) Dissociation Measure: DES	CSA & CPA	CT & EP: (Assessed between and within groups) Reported history of CSA or CPA not significantly different between ED patient group and control group. Analysis comparing AN-BP and BN patients with/without history of CSA and CPA, revealed no significant difference for EDI scores. CT & Dissociation: (Assessed within groups) Analysis comparing AN-BP and BN patients with/without history of CSA and CPA on DES measure revealed significantly higher scores for those reporting CPA but not CSA. Dissociation & EP: Relationship not assessed.

Table 1. Continued

Eating disorder sample assessing two relationships between groups and 1 within groups					
Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
Dalle Grave et al. ⁷³ Italy	64 obese women (BMI > 30) admitted to specialist inpatient treatment centre. Using semi-structured interview and adopting the decision rules of QEWP: 29 participants met criteria for BED.	M = 36.4 SD = 6.1	EP Measure: Semi-structured interview (for diagnosis only) CT Measure: Clinical interview Dissociation Measure: DIS-Q	CSA, CPA, psychological abuse	CT & EP: (Assessed between groups) Participants with BED reported significantly more traumatic experiences than participants without BED. CT & Dissociation: (Assessed within groups) Participants with and without BED who reported trauma scored significantly higher on DES than participants who did not report CT. Dissociation & EP: (Assessed between groups) No significant difference between participants with BED and participants without BED on total DIS-Q. Participants with BED scored significantly higher on two subscales.

Table 1. Continued

Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
Vanderlinden et al. ⁷⁴ Belgium	EP group: 98 patients (2 males) admitted to inpatient eating disorders unit. Using DSM-III-R criteria: 34 AN-R, 24 AN-BP, 28 BN, 12 Atypical ED. Control group: 66 age-matched females	EP Group: 14-42 years (M = 24.3, SD = 6.68) Control Group: 15-37 years (M = 25.03, SD = 5.03)	EP Measure: Diagnosis only CT Measure: Self-report questionnaire (unspecified) and clinical interview Dissociation Measure: DIS-Q	CSA, CPA, neglect & loss of a family member	CT & EP: (Assessed between groups) EP group reported significantly more traumatic experiences than controls. CT & Dissociation: (Assessed within groups) An analysis comparing patients within EP group with/without different types of abuse indicated that only those reporting CSA scored significantly higher on DIS-Q. Dissociation & EP: (Assessed between groups) EP group reported significantly higher DIS-Q scores than control group.

Table 1. Continued

Non-ED sample assessing 2 relationships between individuals with eating psychopathology and without and 1 within groups					
Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
Groth-Marnat and Michel ⁷⁵ Australia	113 participants recruited from a community sample. Using BULIT-R cut-off score: participants divided into 47 current bulimics (CB), 29 past bulimics (PB) and 37 non-bulimics (NB).	M = 30 SD = 6.7	EP Measure: BULIT-R CT Measure: CAI Dissociation Measure: DES	CSA, CPA, psychological abuse	CT & EP: (Assessed between groups) CBs (but not PBs) reported a significantly higher frequency of incidents of CSA and psychological abuse than NBs, but no difference between the groups for CPA. CT & Dissociation: (Assessed within groups) In all three groups, investigating CSA only, participants reporting CSA did not score significantly higher on the DES than participants who did not report CSA. Dissociation& EP: (Assessed between groups) CBs and PBs reported significantly higher total DES scores than NBs.

Table 1. Continued

Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
Favaro and Santonastaso ⁷⁶ Italy	395 female college participants completed questionnaires. 3 cases of AN-R, 3 with BN, 24 with EDNOS were diagnosed using DSM- IV diagnostic criteria and made up the ED group. 81 participants without eating difficulties selected as control group.	M = 20.4 SD = 0.78	EP Measure: EAT, EDE-S CT Measure: DIS- Q Checklist Dissociation Measure: DIS-Q	CSA, CPA, emotional maltreatment	CT & EP: (Assessed between groups) No significant differences between ED group and control group with regards to the number of traumatic experiences reported. CT & Dissociation: (Assessed within all of the original 395 participants) All traumatic experiences were associated with higher scores on the DIS-Q. Dissociation & EP: (Assessed between groups) No significant difference between ED group and control group on the DIS-Q.

Table 1. Continued

Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
Miller et al. ⁷⁷ USA	144 female psychology students selected from 588 women. 72 (12.2%) scored 20 or above on the BITE measure and were identified as having a high probability of having BN (BN Group). 72 demographically matched participants (non-BN group).	Majority aged 18- 19 years old	EP Measure: BITE CT Measure: SLECQ Dissociation Measure: DES	CSA before age of 12 CSA/ adult sexual abuse after age of 12	CT & EP: (Assessed between groups) BN group reported significantly more experiences of sex after age 12 with a relative than non-BN group. No significant difference between the groups in reports of sexual experience before age 12 with other children or with an adult. CT & Dissociation: (Assessed within BN group only) Participants reporting sexual abuse scored significantly higher on the DES than participants who did not report abuse. Dissociation & EP: (Assessed between groups) Participants in the BN group scored significantly higher on the DES than the non-BN group.

Table 1. Continued

ED Sample Mediation Analysis					
Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
Everill et al. ⁷⁸ UK	60 female participants with an ED recruited from an eating disorder service, self-help group and health centre. Using DSM-IV criteria: 5 AN-R, 10 AN-BP, 30 BN with no history of AN, 15 BN with a history of AN.	M = 22.8; SD = 6.3	EP Measure: EAT and number of episodes of bingeing and vomiting over a week. CT Measure: Clinical Interview Dissociation Measure: DES	CSA encompa ssing adult sexual abuse	CT & EP: No significant difference found with regards to EAT scores and frequency of vomiting between participants reporting sexual abuse and those not. Participants reporting sexual abuse reported a higher frequency of binge episodes. CT & Dissociation: Participants reporting sexual abuse scored significantly higher on the DES than Participants reporting no abuse. Dissociation & EP: Higher scores on DES associated with greater frequency of bingeing but not vomiting. Mediation Analysis: ANCOVA analysis with DES scores as covariate indicated DES scores mediated relationship between sexual abuse and binge frequency.

Table 1. Continued

Non-ED Sample Mediation Analysis					
Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
Gerke et al. ²⁸ USA	417 female undergraduates.	16-53 years (M = 19.9; SD = 4.7)	EP Measure: BULIT-R CT Measure: CTQ Dissociation Measure: DES	CSA, CPA, CEA, CEN, CPN	CT & EP: CSA and CEA were the only types of CT to correlate with reported bulimic symptoms. CT & Dissociation: CEA, CEN CPN significantly correlated with DES scores. Dissociation & EP: DES score significantly correlated with reported bulimic symptoms. Mediation Analysis: Baron and Kenny (1986) regression method. Only CEA met criteria for this analysis, (correlated significantly with reported bulimic symptoms and dissociation). Dissociation did not mediate relationship.

Table 1. Continued

Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
Lyubomirsky et al. ⁷⁹	92 female participants recruited from a university setting who had never met DSM-III-R criteria for an ED.	14-63 years (M = 24.3; SD = 8.63).	EP Measure: EAT CT Measure: Interview using open-ended questions Dissociation Measure: DES	CSA encompa ssing adult sexual abuse	CT & EP: EAT scores significantly correlated with sexual abuse. CT & Dissociation: DES scores significantly correlated with sexual abuse. Dissociation & EP: DES scores significantly correlated with EAT scores. Mediation Analysis: Baron and Kenny (1986) regression method. DES scores significantly mediated the relationship between sexual abuse and EAT scores.

Table 1. Continued

Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
Kent et al. ¹¹	236 female	18-48 years (M	EP Measure: EDI	CSA,	CT & EP: All forms of CT significantly correlated
	students.	= 22.3; SD =	CT Measure: CATS	CPA,	with EDI score except CSA.
UK		5.86)	Dissociation Measure: DES	CEA & childhood neglect	CT & Dissociation: All forms of CT except for CSA significantly correlated with DES scores. Dissociation & ED: DES scores significantly predicted EDI scores. Mediation Analysis: Baron and Kenny (1986) regression method. Only CEA significantly predicted EDI scores in the regression analysis. Dissociation as well as anxiety significantly mediated this relationship.

Table 1. Continued

Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
Reto et al. ¹⁸ USA	100 Psychology students and 83 first year graduate students (57 males and 126 females).	17-59 years (M = 29.5)	EP Measure: Bulimia and Drive for Thinness subscales of EDI CT Measure: VHQ Dissociation Measure: DES	CPA	CT & EP: CPA did not significantly predict EDI subscales for females but did significantly predict scores on the Bulimia subscale for males. CT & Dissociation: No significant relationship reported. Dissociation & EP: DES total scores did not significantly predict any of the EDI subscales. Mediation Analysis: Regression analysis conducted using 43 female participants and 13 male participants reporting CPA and symptoms of bulimia. CPA significantly predicted EDI scores for female participants only. DES scores did not significantly predict EDI scores for either males or females. Mediation effect for dissociation therefore not supported.

Table 1. Continued

Study/ Country	Sample Source	Sample Age	Measures Used	CT assessed	Key Findings
Rodriguez- Srednicki ⁶⁵ USA	441 Female college students.	18-23 years (M = 20.6; SD = 1.2)	EP Measure: BES CT Measure: Demographic and background questionnaire Dissociation Measure: DES	CSA	CT & EP: Participants reporting CSA scored significantly higher on BES than participants who did not report CSA. CT & Dissociation: Participants reporting CSA scored significantly higher on DES. Dissociation & EP: DES scores significantly correlated with BES scores. Mediation Analysis: Baron and Kenny (1986) regression method. Regression analysis revealed significant relationship between CSA and BES scores but not between dissociation and BES scores. Mediation effect for dissociation therefore not supported..

ED, eating disorder; AN, Anorexia Nervosa; BN, Bulimia Nervosa; EDNOS, Eating Disorder Not Otherwise Specified; AN-R, Anorexia Nervosa-Restricting subtype; AN-BP, Anorexia Nervosa-Binge Eating purging subtype; BN-P, Bulimia Nervosa-Purging subtype; BN-NP; Bulimia Nervosa-Non-purging subtype; DSM-III-R, Diagnostic and Statistical Manual (Third Edition, Revised); DSM-IV, Diagnostic and Statistical Manual (Fourth Edition); EP, eating psychopathology; CT, childhood

trauma; CEA, childhood emotional abuse; CPA, childhood physical abuse; CSA, childhood sexual abuse; CEN, childhood emotional neglect; CPN, childhood physical neglect; BITE, Bulimic Inventory Test; DDIS, Dissociative Disorders Interview Schedule; DES, Dissociative Experiences Scale; EDI, Eating Disorders Inventory; DIS-Q, Dissociation Questionnaire; WSQ, Wyatt Sexuality Questionnaire; CADSS, Clinician-Administered Dissociative States Scale; LEQ, Life Experiences Questionnaire; BULIT-R, Bulimia Test Revised; TCS-40, Trauma symptom checklist-40; QES, Questionnaire for Eating Styles; BSAE, Brief Scale of Abusive Experiences; QEWP; Spitzer's Questionnaire on Eating and Weight Patterns; CAI, Child Abuse Inventory; EAT, Eating Attitudes Test; EDE-S, Eating Disorder Examination Screening Version; SLECQ, Sexual Life Events Questionnaire; CTQ; Childhood Trauma Questionnaire; BES, Bing Eating Scale; VHQ, Violence History Questionnaire

Table 2. Ratings of study quality for included studies.

Study	Quality Criterion														Total Score
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Berger et al. ⁶⁶	AC	PA	NAP	WC	NA	NA	PA	AC	AC	PA	NA	WC	NA	AC	17
Favaro et al. ⁶⁷	WC	AC	NAP	WC	NA	NA	PA	AC	AC	PA	NA	NA	NA	PA	15
McCallum et al. ²¹	PA	PA	NAP	PA	NA	NA	PA	NA	AC	PA	NA	NA	NA	PA	8
McShane and Zirkel ⁴⁷	WC	AC	NAP	WC	AC	WC	PA	NA	WC	NA	NA	NA	NA	WC	20
McCarthy et al. ⁶⁸	AC	PA	NAP	WC	NA	WC	AC	NA	WC	AC	NA	WC	PA	AC	21
Korte et al. ⁶⁹	WC	PA	NAP	AC	NA	NA	AC	WC	PA	AC	NA	WC	PA	WC	21
Mercado et al. ⁷⁰	AC	PA	NAP	AC	NA	NA	PA	AC	WC	PA	NA	WC	AC	PA	18
Dalle Grave et al. ⁷¹	AC	WC	NA	PA	NA	NA	PA	NA	AC	PA	NA	PA	NA	PA	12
Nagata et al. ⁷²	PA	PA	AC	WC	NA	NA	PA	AC	AC	PA	NA	WC	NA	PA	17

Table 2. Continued

Study	Quality Criterion														Total Score
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Dalle Grave et al. ⁷³	AC	AC	AC	PA	NA	NA	PA	PA	AC	PA	NA	NA	PA	NA	13
Vanderlinden et al. ⁷⁴	AC	PA	AC	WC	NA	NA	PA	NA	WC	PA	NA	PA	PA	AC	17
Groth-Marnat and Michel ⁷⁵	WC	AC	AC	PA	NA	PA	PA	WC	WC	PA	NA	PA	PA	AC	21
Favaro and Santonastaso ⁷⁶	AC	AC	NA	WC	WC	WC	NA	AC	AC	PA	NA	PA	PA	AC	22
Miller et al. ⁷⁷	PA	AC	AC	AC	NA	NA	PA	AC	WC	PA	NA	PA	PA	NA	16
Everill et al. ⁷⁸	WC	AC	AC	WC	NA	AC	PA	PA	AC	PA	NA	NA	WC	AC	22
Gerke et al. ²⁸	WC	AC	NAP	NAP	NA	WC	WC	WC	WC	WC	NA	WC	WC	WC	29
Lyubomirsky et al. ⁷⁹	PA	WC	NAP	NAP	NA	NA	PA	AC	WC	PA	NA	NA	WC	AC	16

Table 2. Continued

Study	Quality Criterion														Total Score
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Kent et al. ¹¹	WC	AC	NAP	NAP	NA	NA	AC	AC	AC	AC	NA	WC	WC	AC	21
Reto et al. ¹⁸	WC	AC	NAP	NAP	NA	PA	AC	AC	AC	WC	NA	WC	WC	AC	23
Rodriguez-Srednicki ⁸⁰	PA	PA	NAP	NAP	NA	NA	PA	AC	WC	PA	NA	WC	WC	NA	15

Quality Criterion: 1, Rationale for investigating all three variables; 2, sample description; 3, group comparability; 4, classification of eating psychopathology; 5, uptake; 6, attrition; 7, definition of childhood trauma; 8, reliability/validity of eating psychopathology measure; 9, reliability/validity of dissociation measure; 10, reliability/validity of childhood trauma measure; 11, statistical power of study; 12, types childhood trauma assessed separately; 13, test of theory driven model involving the three variables; 14, generalisability, limitation and implications. Ratings: WC, well covered (3 points); AC, adequately covered (2 points); PA, poorly addressed (1 point); NA, not addressed; and NAP, not applicable (both 0 points).

2.6. Conclusion

This review set out to investigate whether dissociation may potentially mediate the relationship between childhood trauma and eating psychopathology. The studies included demonstrated mixed findings in their reported relationships between childhood trauma, eating psychopathology and dissociation. These mixed findings were observed more frequently when the relationship between childhood trauma and eating psychopathology was assessed. More consistent support was found for significant relationships between childhood trauma and dissociation and between dissociation and eating psychopathology. Such findings may be indicative of a potential mediational effect involving dissociation. That is, childhood trauma (IV) may be associated with dissociation (M) that is in turn associated with eating psychopathology. However, studies that addressed the potential mediating role of dissociation in the relationship between childhood trauma and eating psychopathology directly using mediation analysis reported mixed evidence.

2.6.1 Limitations in the Literature and Directions for Future Research

Although this broad systematic review of the literature has identified some support for the potential role of dissociation as a mediator, conclusive results cannot be established due to a number of methodological difficulties within the reviewed literature.

Of the 20 studies, only 7 studies^{11,18,28,70,78-80} were rated to have adequately addressed a theory driven model involving the three variables. Further, despite assessing all three variables, 6 studies did not assess all three relationships meaning that the opportunity to establish potentially important relationships was missed. Many studies opted to assess the potential relationships in a number of different ways. Some studies assessed group differences across the variables between participants with a diagnosed eating disorder (or significant eating psychopathology) and participants without a diagnosed eating disorder (or significant eating psychopathology). Other studies assessed group differences across the variables between participants reporting childhood trauma and those not reporting childhood trauma.

Relationships were also frequently assessed using different groups within the same study. For example One study⁶⁹ assessed the relationship between eating psychopathology and childhood trauma using a between group analysis (reporting childhood trauma versus not reporting childhood trauma); the relationship between eating psychopathology and dissociation using a between group analysis with different groups (significant eating psychopathology versus non-significant eating psychopathology); and the relationship between childhood trauma and dissociation within the sample as a whole using a correlational analysis. Therefore although all three relationships were investigated, it is difficult to establish the nature of these relationships as well as the generalisability of these findings. In order to establish the role of dissociation in the relationship between childhood trauma and eating psychopathology studies should assess the three relationships using the same group(s) or statistical analyses.

More studies that address the potential mediating role of dissociation through mediation analysis are needed. Further, studies suggest that other theory driven mediators should be considered alongside dissociation.¹¹

The main methodological difficulty identified in the review surrounds the definition and measurement of childhood trauma. Few studies defined the types of childhood trauma explicitly within their study and only 4 studies^{11,18,28,68} employed an unmodified reliable and valid measure of childhood trauma. In contrast to the dissociation measures used within the reviewed studies, few studies used the same measures for assessing childhood trauma. As well as assessing for different types of childhood trauma, the measures assessed for different aspects or severity of the same trauma. These shortcomings within the literature make replication and comparison between the studies more difficult.

A number of studies within the review appeared to include adult abuse within their definition and assessment of childhood trauma^{21,45,47,71,73,74,77-79} Although studies have suggested that individuals who report experiencing abuse in adulthood also frequently report childhood abuse,⁸¹ this inclusion represents a significant methodological issue. As discussed in the introduction to this review, it has been proposed that a number of mental health related difficulties, including eating psychopathology, may be activated through developmental processes as means of coping with the emotional consequences of childhood trauma.⁴⁶ Dissociation may be one such developmental process.⁸² Further, it is proposed that, although dissociation

may originate as a natural defence against overwhelming trauma in childhood, dissociation may become an automatic response to stress in later life.⁸³ The inclusion of adult abuse, then, does not allow conclusions to be drawn about the possible developmental pathways linking childhood trauma, eating psychopathology and dissociation. Further, if dissociation is a natural defence mechanism against trauma,⁴⁶ individuals who experience adult abuse may present with higher levels of dissociation due to the timeliness of the abuse rather than because dissociation is related to either longstanding childhood trauma or eating psychopathology . Additionally, research investigating the effect of childhood trauma and adult abuse on eating psychopathology concluded that adult abuse contributed independently to eating psychopathology.²⁵ Although there is logic to investigating both adult and childhood trauma within a single study, such studies should assess the unique contribution of both childhood trauma and adult abuse.

In a recent systematic review of childhood trauma and psychiatric disorders,⁸⁴ it was discussed that a number of their reviewed studies used methods that may have resulted in varied disclosure rates of childhood trauma. The authors pointed to a study⁸⁵ that found that participants reported significantly more abuse histories using confidential self-report measures in comparison to asking about abuse history within general questions in a psychiatric intake interview. Three studies^{73,78,79} in the present review used this method to assess for childhood trauma and, therefore, there is a potential that childhood trauma may have been underreported in these studies.

The majority of the studies assessed for childhood physical and sexual abuse only. There is no evidence that these forms of trauma are more important stressors than other forms of childhood traumas⁸⁴ and a number of studies have highlighted that other forms of childhood trauma such as emotional abuse and neglect may be related to eating psychopathology.^{25,86} It is proposed that future studies investigating childhood trauma should use validated trauma measures that include a range of subtypes of childhood trauma. The CTQ⁵⁸ is an example of a measure that offers such properties.

It was also notable that 5 studies did not include a measure of eating psychopathology.^{21,47,68,71,74} Assessing the severity and prevalence of childhood trauma and dissociation between individuals with and without a diagnosed eating disorder provides one way to investigate these variables in relation to eating psychopathology. However, eating psychopathology will differ in severity amongst individuals with the same diagnosis. The addition of a measure of eating psychopathology would help to establish whether more severe trauma and dissociation is associated with more severe symptoms of eating psychopathology. Only 5 studies recruited male participants with numbers typically being too low to analyse male participants separately. A number of studies have discussed the merit of assessing eating psychopathology with male participants within clinical as well as non-clinical samples, with eating psychopathology being reported to concern males more than previously acknowledged^{87,88} Finally, it is noteworthy that no longitudinal studies were identified in this review. The lack of longitudinal research designs also makes any conclusions surrounding cause and effect mechanisms difficult.

2.6.2 Strengths and Limitations of This Review

Establishing psychological mediators within the childhood trauma and eating psychopathology relationship is important to better predict, understand and treat eating psychopathology. In an attempt to investigate the potential mediating role of dissociation in the relationship between childhood trauma and eating psychopathology, this review had a broad inclusion criteria allowing for studies that investigated all three of these variables within a single study. This proved necessary as only 6 studies directly addressed a mediational role for dissociation. However, the studies identified proved to have heterogeneous methods for assessing the different relationships between the variables and a number of methodological difficulties were identified. As a result, conclusive evidence regarding the role of dissociation as a mediator cannot be drawn within this review. Further, as the search was limited to published peer-reviewed English language journals, it is possible that this review suffers from publication bias.

2.6.3 Summary and Conclusions

This review found more evidence supporting relationships between childhood trauma and dissociation and between dissociation and eating psychopathology than for a direct relationship between childhood trauma and eating psychopathology. Studies that addressed the mediation effect of dissociation in the relationship between childhood trauma and eating psychopathology through mediation analysis offered

mixed support. Taken together, these findings indicate that there is tentative evidence for an indirect association between childhood trauma and eating psychopathology through dissociation. Investigators should continue to consider dissociation as a potential mediator in the relationship between childhood trauma and eating psychopathology. However, in order to obtain more conclusive evidence regarding the potential mediational role of dissociation, future studies need to address the methodological issues identified within this review.

2.7 References

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Chapter 3: Methodology

3.1 Design

This study employed a quantitative cross sectional survey design using standardised questionnaires and recruiting Psychology undergraduate students (aged 18 years and older) from two universities.

3.2 Participants

Participants were recruited from the University of Stirling and the University of Dundee. Participants were all first and second year undergraduate Psychology students. Participants were eligible to participate in the study if they were English speaking and aged 18-years or older. Participants at universities of Dundee and Stirling received course credit for their participation.

Approximately 600 undergraduate Psychology students in first and second year at the University of Dundee were eligible to take part in the study. 89 participants elected to take part (approximately 14.8% uptake). 391 undergraduate Psychology students in first and second year at the University of Stirling were invited to take part in the study. 76 participants elected to take part (approximately 19.4% uptake). Therefore a total of 165 participants elected to take part in the study, with an overall approximate uptake of 16.6%. Participants were aged between 18 and 64 years ($M = 21.4$; $SD = 6.1$). 142 participants were female (86.1%) and 23 were male (13.9%).

3.3 Measures

3.3.1 Demographic Information

Information regarding the participants' gender, age, approximate weight and height, marital status and whether they had ever sought help for anxiety, depression or difficulties with eating was collected through a brief covering sheet (See Appendix 2 for a copy of the demographics sheet). In addition, participants also completed the standardised measures detailed below.

3.3.2 Eating Disorders Examination-Questionnaire (EDE-Q; Fairburn & Beglin, 1994)

The EDE-Q is a self-report version of the Eating Disorders Examination (EDE; Fairburn & Cooper, 1993) which is a semi-structured investigator based interview. The EDE is generally considered the 'gold standard' instrument for assessing disordered eating attitudes and behaviours (Guest, 2000). A strong correspondence between the EDE-Q and EDE has been documented within the literature (e.g. Binford, *et al.*, 2005). The EDE-Q has been used by both researchers and clinicians to assess eating psychopathology.

The EDE-Q consists of 28 items from which a global score and four subscale scores can be derived by summing the item scores. The subscales relate to dietary restraint, eating concern, weight concern and shape concern. Responses are made on a 7-point Likert scale ranging from, '0' ('not at all') to '6' ('markedly'). Respondents are asked to rate each item based on the past four weeks (28 days) with higher scores indicating greater eating psychopathology.

A recent systematic review of studies assessing the reliability and validity of the EDE-Q (Berg, *et al.*, 2012) concluded that the measure has sound psychometric properties and is able to discriminate between individuals with and without a diagnosed eating disorder. The EDE-Q has been used to assess norms for eating psychopathology in both female (Luce *et al.*, 2008; Rø *et al.*, 2010) and male (Lavender *et al.*, 2010) undergraduate students. Luce and Crowther (1999) reported test-retest reliability coefficients ranging from .81 to .94 for the four subscales and Cronbach's Alpha ranged from .78 to .93. In the current sample, Cronbach's Alpha was .98 for the global scale and ranged from .82 to .92 for the four subscales.

3.3.3 Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998)

The CTQ is a 28-item self-report questionnaire that assesses for a history of childhood sexual, physical and emotional abuse and physical and emotional neglect. The CTQ was designed for use in both clinical and nonclinical settings (Bernstein & Fink, 1998). It is suitable for use with individuals aged 12-years and older. The CTQ is generally considered as the leading measure of adult recall of childhood trauma (Baker & Maiorino, 2010).

Respondents are asked to rate the frequency with which they experienced each of the 28 items during their childhood on a five-point Likert-scale from '1' ('never true') through to '5' ('very often true'). Five items are used to assess for each form of childhood trauma with an additional three items making up the minimisation/denial scale. The five items for each form of trauma are totalled to form a total subscale score. An example item included in the emotional abuse subscale is "I thought that my parents wished I had never been born".

The CTQ has demonstrated excellent psychometric properties in both clinical and nonclinical populations (Baker & Maiorino, 2010). Bernstein and Fink (1998) investigated the measure's psychometric properties in an undergraduate sample and reported internal consistency reliability coefficients using Cronbach's Alpha of .89 for emotional abuse, .78 for physical abuse subscale, .72 for sexual abuse, .92 for emotional neglect and .60 for physical neglect. Test-re-test reliability has been established over a mean of 3.6 months (Bernstein & Fink, 1998) with coefficients ranging from .79 (physical neglect) to .81 (sexual abuse and emotional neglect).

Factorial validity of the measure has been demonstrated using factor analysis with clinical and nonclinical participants (Bernstein *et al.*, 2003) as well as male and female undergraduates (Paivio & Cramer, 2004). These studies have supported the proposed five-factor structure. In the current study internal consistency estimates using Cronbach's alpha were .88 for the emotional abuse subscale, .87 for the physical abuse subscale, .89 for the sexual abuse subscale, .89 for the emotional neglect subscale and .78 for the physical neglect subscale.

3.3.4 Dissociative Experiences Scale-II (DES-II; Carlson & Putnam, 1993)

The DES-II measure is a self-report measure for measuring dissociation in both clinical and nonclinical populations. The DES-II consists of 28 items that assess for the frequency of various daily life experiences of dissociative phenomena.

Disturbances in memory, identity, absorption as well as depersonalisation and derealisation are all assessed. Respondents are asked to estimate the percentage of time that the various experiences happen to them in their daily lives on 11-point scale

ranging from 0% to 100%, at 10% intervals. The total score is the mean of the 28 items and ranges from 0 to 100.

The DES-II has demonstrated high internal consistency, with a Cronbach's alpha of .95 for the overall score (Carlson & Putnam, 1993). Bernstein and Putnam (1986) report a split-half reliability of .83 and a test-retest coefficient of .84 over a 4 to 8 week interval. These authors also demonstrated that the measure is able to significantly discriminate between individuals with and without a diagnosis of dissociative disorder. Carlson and Putnam (1993) reported both strong convergent and discriminant validity.

The DES has been used within previous research to investigate dissociation in relation to eating psychopathology with eating disordered clinical samples (e.g. Beato, Cano, & Belmonte, 2003) as well as student samples (e.g. Gerke *et al.*, 2006). The current study found an internal consistency estimate using Cronbach's alpha of .93.

3.3.5 Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)

The DERS is a 36-item self-report measure that assesses an individual's difficulty with regulating emotions through adaptive emotion modulation strategies. The measure has been used to assess emotional regulation difficulties in undergraduate (Tull *et al.*, 2007) as well as clinical samples (Harrison *et al.*, 2009, 2010).

Respondents are asked to indicate how often the items apply to themselves with responses ranging from '1' ('almost never; 0-10%') to '5' ('almost always; 91-

100%'). Higher scores indicate greater difficulties with regulating emotion (or emotion dysregulation).

In order to assess an individual's difficulties in regulating emotions when they are experiencing distress, 27 of the 36 items begin with "When I'm upset". A total score is derived which reflects the respondent's overall difficulties with regulating emotions. The measure also includes six subscales that reflect the author's proposed dimensions of emotion regulation/dysregulation. *Nonacceptance* refers to the degree to which an individual responds to negative emotions with a negative reaction; *Goals* relates to an individual's difficulty in engaging in goal-directed behaviour when experiencing negative emotion; *Impulse* relates to an individual's difficulty in controlling impulses when experiencing negative emotions; *Awareness* relates to an individual's ability attend to and understand their emotions; *Clarity* relates to an individual's difficulty in identifying their emotional responses; and *Strategies* relates to an individual's difficulty in identifying effective strategies that they perceive as effective for regulating their emotion.

Gratz and Roemer (2004) report strong internal consistency for the total scale with a Cronbach's alpha of .93. They also report that the items for the subscales demonstrated Cronbach's alphas greater than .80. The overall DERS score demonstrated good test-retest reliability over a 4-8 week interval with a coefficient of .88. The authors report that the measure has adequate construct and predictive validity.

The DERS has been used within previous research to investigate emotional regulation difficulties within individuals with an eating disorder (e.g. Harrison *et al.*,

2009). The DERS has also been used investigate emotional regulation difficulties in relation to eating psychopathology within undergraduate samples (e.g. Burns *et al.*, 2012).

In the current study, Cronbach's alpha for the total scale was .95 and Cronbach's alphas ranged between .84 (Awareness) and .92 (Nonacceptance and Goals) for the five subscales.

3.4 Power Calculations

In line with previous studies that have tested for mediation effects between childhood trauma and eating psychopathology (e.g. Kong & Bernstein, 2009), a medium effect size was expected. Guidelines are provided by Fritz and MacKinnon (2007) for estimating required sample sizes necessary for detecting mediation effects. The guidelines are based on their review of 166 articles reporting mediation methodology. The authors suggest that with a medium effect size, a minimum sample size of 90 is required in order to achieve a power of .80 for most types of mediation analyses (Fritz & MacKinnon, 2007).

Hayes and colleagues have more recently advocated the use of non-parametric methods to detect mediation effects that do not require specific sample sizes such as the bootstrapping method (Hayes, 2009; Preacher & Hayes, 2004). Although this method does not require a specific sample size, the reliability of the confidence intervals generated generally increases with sample size (Preacher & Hayes, 2004). Using the above conditions, an estimated sample size of at least 71 participants is suggested in the guidelines provided by Fritz and MacKinnon (2007) for the bias-

corrected bootstrapping method. This method (see statistical analysis section) was chosen for detecting mediation effects within the present study.

3.5 Ethics

3.5.1 Ethical Approval

Ethical approval was received from the University of Edinburgh Clinical Psychology Research and Ethics Committee.

Ethical approval for the same protocol was received from both the University of Dundee Research Ethics Committee and the University of Stirling Psychology Ethics Committee (see Appendix 3 and Appendix 4).

3.5.2 Ethical Considerations Raised By the Study

The main ethical consideration during the initial stages of the projects surrounded the subject of the questionnaires. Through completion of the questionnaires, participants would be asked questions surrounding their eating behaviour and thoughts concerning body shape and weight. Additionally, participants would be asked questions concerning a history of potential abuse and neglect. Therefore there was a potential for the questions to cause a degree of distress to some individuals.

The measures were therefore chosen with due consideration. All the measures chosen were reliable and valid measures that have been used in previous research with undergraduate samples with no evidence to suggest that completion of these measures results in distress. To further reduce the potential for distress, participants were informed regarding the topics of the questionnaires before signing up for the study. The possibility of eliciting difficult emotions was highlighted and participants

were encouraged not to sign up for the study if they felt that answering such questions may cause them distress. Participants who chose to sign up for the study were provided with an information sheet (which again highlighted the possibility of eliciting difficult emotions) and were given the chance to discuss any concerns with the researchers before informed consent was obtained.

Participants were given the contact details for the staff members who were attached to the project at both Universities and encouraged to discuss any difficulties raised by the study with them. The staff member at the University of Dundee is a qualified Clinical Psychologist and the staff member at the University of Stirling was a qualified Health Psychologist. Participants were also given a debriefing sheet that listed contact details for campus and community resources. Contact details for the researcher were detailed so that participants could discuss any concerns that may have been raised during participation.

3.6 Procedure

3.6.1 Invitation to take part in the research and recruitment

Participants at the University of Dundee (UOD) were invited to take part in the study through an online research management system. Participants at the University of Stirling (UOS) were invited to take part in the study through a first and second year Psychology group email. The present study was entitled ‘Childhood experiences, emotions and eating behaviour’. Participants were informed that the study aimed to investigate theoretical links between, eating behaviours, managing emotions and negative childhood experiences. Participants were informed that participation would involve completing some brief demographic information as well as 4 questionnaires.

They were informed that all data collected would be made anonymous. Participants were encouraged not to take part in the study if they had any concerns about answering questions surrounding these topics. Contact details for the author as well as a University staff member were provided. Participants were encouraged to contact the author or the specified staff member if they had any further queries. Participants at the UOD who wished to take part in the study signed up through the research management software to attend an allocated testing slot. Participants at the UOS who wished to take part in the study were asked to collect a questionnaire pack from the Psychology Office.

No queries were received from participants at either university following these initial invitations.

An additional ethical issue concerned the confidentiality of the data collected. In accordance with guidelines from the University of Edinburgh, all questionnaires were anonymous and treated as strictly confidential. In order to prevent participant identification, questionnaires and consent forms were stored within separate secure locations. Unidentifiable information will be stored for a minimum period of 10 years with subsequent review built in to assess any ongoing reason as to why the data should be kept for any longer than this period.

3.6.2 Informed consent and distribution of questionnaires

Participants at the UOD who had signed up to take part in the study completed the questionnaires in groups of 10 to 12 participants within the teaching rooms of the University. The researcher handed out the participant information sheet (see Appendix 5). In accordance with ethical approval from both Universities, the

information sheet highlighted that some of the questionnaires contained questions that related to experiences of abuse, neglect and eating difficulties and that these questions may potentially give rise to difficult feelings. It was emphasised that participation in the study was entirely voluntary and that they were free to withdraw from the study at any point.

All participants were required to provide informed consent prior to participation. Participants who wished to take part completed the consent form (see Appendix 6) on the front of the questionnaire pack. All consent forms were removed from the questionnaire pack and stored separately in a secure location. As this form contained the participant's name and signature, removal of the form ensured that questionnaires remained anonymous. A unique identifying number was printed on the consent form and questionnaire pack so that questionnaires could be matched to a corresponding consent form before data entry.

After providing informed consent, all participants completed a questionnaire pack containing in the following order the demographic information sheet, EDE-Q, DES, DERS and CTQ. Participants were asked to place their completed questionnaires back within in the provided sealable envelope. No participants chose to withdraw from the study.

Following completion of the questionnaires, participants were provided with a debriefing sheet explaining the objectives of the study and given contact details for appropriate support agencies (see Appendix 7).

The same procedure was adopted using the same materials as above; however, participants collected the questionnaires from the Psychology office and completed

the questionnaires on an individual basis. Following completion of these, participants were asked to return the questionnaire packs to the office where they were provided with the debriefing sheet.

3.7 Statistical Analysis

3.7.1 Data Collation

Data from the questionnaires were entered into the IBM Statistical Package for the Social Sciences (SPSS) version 19 for Windows. Following a missing data analysis, the overall percentage of missing data was 0.5%. To investigate whether data were missing at random, the Little's Missing Completely at Random (MCAR) test was carried out. This analysis did not reach significance ($\chi^2 = 2008.12$, $df = 2014$, $p = 1.96$), indicating that data were missing at random. As well as reducing sample size and power, case deletion has been criticised due to the potential for producing bias (Fox-Wasylyshyn & El-Masri, 2005; Tabachnick & Fidell, 2001). Therefore, missing values within the dataset were replaced with the individual's mean for the relevant subscale. As case mean substitution takes account of individual differences, it is potentially more robust than using group means and is widely used within research using self-report measures (Fox-Wasylyshyn & El-Masri, 2005).

Where there was insufficient data to calculate an individual's mean, the participant was excluded from the analysis for that measure only. The full scale scores for the EDE-Q, DES and DERS were used for the different analyses within this study. 2 participants did not complete the CTQ measure, 1 participant did not complete the DES measure, and 1 participant did not complete a subscale of the EDE-Q. Therefore these participants were excluded from the analyses involving these variables. This

meant that for mediation analysis (involving all 4 of the variables) the total sample size was 161.

3.7.2 Analysis of the data

Data were found to be positively skewed across all measures. Transformations were considered, however, Bernstein and Putnam (1986) discuss that the DES measure is not normally distributed and recommend the use of non-parametric statistics.

Research using the CTQ has also reported positively skewed data with non-parametric tests being utilised (e.g. Ucok & Bikmaz, 2007). It was therefore decided that non-parametric tests would be utilised within the different analyses.

In order to explore any potential gender or recruitment site differences across the variables, the Mann–Whitney U-test was used for continuous variables and chi-squared test was used for categorical variables. Spearman's correlation analyses were used to explore relationships between the variables.

Careful consideration was given with regards to the main mediation analysis. A literature review by Preacher and Hayes (2004) indicated that the most commonly used approach to investigating mediation effects is the approach advocated by Baron and Kenny (1986). However, because this approach requires so many steps (with statistical significance a requirement at each step), this method of testing for mediation may suffer from a lack statistical power (MacKinnon *et al.*, 2002; Preacher & Hayes, 2004). Further, Preacher and Hayes (2004) discuss that this traditional method assumes a normal distribution. However, they point out that the distribution of products are often positively skewed meaning that tests that assume normality are

typically underpowered. Bootstrapping is a non-parametric approach to effect size estimation that makes no assumptions about distributions (Hayes, 2009).

Given the above, it was decided that the multiple mediation analyses would be carried out to investigate the mediation hypotheses using Preacher and Hayes (2008) 'Indirect' SPSS macro for multiple mediation. This program is downloadable from Andrew Hayes' website and is run through SPSS. This approach involves bootstrapping the sampling distribution of the indirect effect and deriving a confidence interval to establish an empirically derived sampling distribution of the indirect effect. In line with (Preacher & Hayes, 2004) recommendations, the indirect effect was investigated using bias corrected 95% confidence intervals with 5000 bootstrap samples.

Hayes (2009) discusses that, within the literature, a distinction between 'indirect effects' and mediation is often made. According to Hayes (2009), if the independent variable (type of childhood trauma in this study), is shown to be associated with the dependent variable (eating psychopathology in this study), then mediation is being assessed for. If there is no evidence that the independent variable is associated with the dependent variable, then an indirect effect is being assessed for (for a fuller discussion of this distinction see Mathieu & Taylor, 2006). Therefore when there is no observed association between the independent and dependent variable, we are assessing for the independent variable's indirect effect on the dependent variable through a third variable. The distinction between indirect effects and mediation will be used within the present study

The independent variable within the mediation analyses was the type of childhood trauma, namely emotional, sexual, physical abuse or emotional and physical neglect. The dependent variable was eating psychopathology (as assessed by the EDE-Q global score). Potential mediators were dissociation or emotional dysregulation. If one of the independent variables is found to be significantly associated with eating psychopathology, the mediation effects of dissociation and emotional regulation will be assessed for. If an independent variable is not found to be significantly associated with eating psychopathology, the indirect effects of dissociation and emotional regulation will be assessed for.

Chapter 4: Journal Article

4.1 Title Page

**Childhood trauma and eating psychopathology: A mediating role for
dissociation and emotion dysregulation?**

(Article produced in accordance with the author submission guidelines for: Child
Abuse & Neglect, see Appendix 8)

4.2 Abstract

Objectives: The present study examined the association between different forms of childhood trauma and eating psychopathology. Additionally, in order to extend upon previous research, the authors aimed to investigate whether a history of childhood trauma was indirectly associated with eating psychopathology through mediation by dissociation and/or emotion dysregulation.

Methods: 165 undergraduate Psychology students participated in this cross-sectional study. Participants completed measures of childhood trauma, eating psychopathology, dissociation and emotion dysregulation. Experiences of multiple forms of childhood trauma were assessed, including emotional abuse (CEA), physical abuse (CPA), sexual abuse (CSA), emotional neglect (CEN) and physical neglect (CPN).

Results: Within the whole sample, CEA and CEN were both significantly associated with increased eating psychopathology. These relationships were significantly mediated by both dissociation and emotion dysregulation. A separate analysis with female participants only, indicated that CPA and CPN in addition to CEA and CEN were significantly associated with increased eating psychopathology. Dissociation and emotion dysregulation significantly mediated the relationships between CEA, CEN, CPN and eating psychopathology.

Conclusions: This study provides support for a growing consensus that emotional maltreatment may be an important risk factor for the development of eating

psychopathology. The results indicate that emotional maltreatment impacts indirectly on eating psychopathology through an enduring effect on both dissociative and emotion regulation processes.

Keywords: Trauma, eating psychopathology, dissociation, emotion regulation.

4.3 Introduction

Childhood sexual abuse (CSA) and, to a lesser extent, childhood physical abuse (CPA) have been highlighted as risk factors for the development of eating psychopathology (Gentile, Raghavan, Rajah, & Gates, 2007; Wonderlich et al., 2001). Reviews of the literature have concluded that, CSA is associated with eating psychopathology, particularly of the bulimic subtype (e.g. Thompson & Wonderlich, 2004). CSA has not, however, been established as a causal risk factor for the development of eating psychopathology within these reviews.

The potential etiological role of a history of childhood emotional abuse (CEA) in the development of eating psychopathology has received less attention than CSA and CPA (Kent & Waller, 2000). More recent studies have reported an association however (Burns, Fischer, Jackson, & Harding, 2012; Kong & Bernstein, 2009). The more recent focus on CEA is interesting as researchers have theorised that it is when the form of childhood trauma involves an emotionally abusive component that it will be associated with eating psychopathology (Kent, Waller, & Dagnan, 1999). Indeed, this may go some way to explain the mixed support observed within studies investigating CSA and CPA as risk factors for eating psychopathology.

As with CSA, studies investigating other types of childhood trauma have mainly been descriptive and, therefore, have been unable to establish a causal link to

subsequent eating psychopathology. Consequently, researchers have begun to investigate the potential psychological processes that may elicit subsequent eating psychopathology. Previous authors discuss that both trauma and developmental processes are likely to be important mediators in the link between childhood trauma and later functioning (Briere & Scott, 2007; Egeland, 2009).

One of the first proposed mediators that fell within both developmental and trauma frameworks was dissociation (Everill, Waller, & Macdonald, 1995; van der Kolk & Fisler, 1994). Dissociation is considered to be a natural defence mechanism in response to trauma and refers to the tendency for traumatised individuals to experience alterations in conscious awareness including; depersonalisation, derealisation, amnesia and absorption (Gershuny & Thayer, 1999). Dissociative experiences tend to occur most frequently during childhood and to decrease between early adolescence and young adulthood (Putnam, 1993). Children who have experienced CSA, CPA and neglect tend to report more dissociation than children reporting no such maltreatment (Macfie, Cicchetti, & Toth, 2001).

Eating disorders typically have their onset during adolescence and young adulthood (Fairburn & Harrison, 2003). As, discussed, dissociation should decrease during this period. However, elevated levels of dissociation have been reported within eating disorder samples (Vanderlinden, Vandereycken, & Claes, 2007) with higher levels being linked to more severe eating psychopathology (Demitrack, Putnam, Brewerton, Brandt, & Gold, 1990). Taking these findings together, researchers have proposed

that eating psychopathology (encompassing bingeing, purging and restrictive behaviours) may serve as a means of dissociating from trauma related-affects (Briere & Scott, 2007). Further, the continued use of dissociation, and behaviours that may serve to bring about dissociation, beyond adolescence may prevent the development of adaptive coping strategies for regulating negative emotions in a range of everyday experiences in addition to trauma related affect (Farrington et al., 2002). Therefore difficulties with emotion regulation may also be relevant.

Emotion regulation is an emerging field within psychology and has received increased attention with regards to a range of mental health related difficulties (Gross, 1998; Fox & Power, 2009). Noting its relevance to these diverse difficulties, Gratz and Roemer (2004) conceptualise emotion regulation/dysregulation as involving a number of dimensions. In addition to the ability to temper emotional arousal, their conceptualisation involves having an awareness and understanding of one's emotions as well as the ability to accept one's emotions, and function purposely regardless of one's emotional state.

Emotion dysregulation, like dissociation, has been linked to developmental factors as well as trauma. Recovery from trauma requires adaptive regulation of emotion and, therefore, emotional dysregulation has been cited as a risk factor for the maintenance of trauma related symptoms (Ehring & Quack, 2010). Greater difficulties with emotion regulation have been reported in individuals who have been exposed to interpersonal trauma during childhood (Cloitre, Miranda, Stovall-McClough, & Han,

2005; van der Kolk, Roth, Pelcovitz, Sunday, & Spinazzola, 2005). Authors have suggested that attachment may go some way to explaining such findings (Briere & Rickards, 2007). Secure attachment appears to be crucial for the development of adaptive emotion regulation (Mikulincer & Shaver, 2008). Emotional maltreatment may be particularly relevant, as this has been associated with the development of insecure attachment (Egeland, Sroufe, & Erickson, 1983). Furthermore, significant associations have been observed between CEA and adult emotion dysregulation (Gratz, Bornovalova, Delany-Brumsey, Nick, & Lejuez, 2007).

Both insecure attachment (Ward, Ramsay, & Treasure, 2000) and emotion dysregulation (Fox & Power, 2009) have been positively associated with disordered eating. It has been proposed that disordered eating, including bingeing, vomiting and restriction may serve to regulate negative emotion (Cooper, Wells, & Todd, 2004; Corstorphine, 2006) particularly through avoidance of affect (Heatherton & Baumeister, 1991).

The potential role of both dissociation and emotion regulation as mediating factors for the link between childhood trauma and eating psychopathology is consistent with Briere's (2002) self-trauma model of childhood abuse and neglect. In this model, the specific psychological impact on an individual who has experienced childhood trauma will vary as a function of a number of biopsychological variables including the family environment and attachment to the caregiver. This model holds that individuals who have experienced childhood trauma may have difficulty with emotion regulation due to inadequate opportunities to develop sufficient emotion

regulation skills. A difficulty with emotion regulation may result in the individual responding to emotions or negative cognitions with behaviours that help the individual to avoid, distract or dampen down emotions. Eating psychopathology may be an example of such behaviour (Briere & Scott, 2007). The continued activation of memories, cognitions and emotions that relate to the individual's experience of childhood abuse and neglect combined with a difficulty with emotion regulation may continue to exasperate the individual's suffering causing them to continue to engage in such behaviours (Briere, 2002). Taking stock of the literature suggests that dissociation and emotion dysregulation are both plausible candidates for potential mediators in the link between childhood trauma and eating psychopathology. Dissociation has received some attention as a potential mediator within the literature already. Findings for this potential role have been mixed, however. Everill et al. (1995) found that dissociation significantly mediated the relationship between CSA and binge eating within a female clinical sample that included individuals diagnosed with bulimia nervosa and anorexia nervosa. Gerke, Mazzeo, and Kliewer (2006), however, found that dissociation was not a significant mediator between multiple forms of childhood trauma and bulimic behaviours in a sample of female undergraduates. Finally, again within a sample of female students, Kent et al. (1999) found that dissociation was only a significant mediator between CEA and eating psychopathology. CPA and CSA did not significantly predict eating psychopathology. Only one study to date has investigated emotion dysregulation as a potential mediator (Burns et al., 2012). This study found that within a female student sample, CEA, as opposed to CSA and CPA, was the only form of childhood trauma

to be consistently associated with eating psychopathology and this relationship was mediated by emotion dysregulation.

Despite apparent similarities between dissociation and emotion regulation, very little is known about the relationship between these two phenomena (Briere, 2006).

Engelberg, Steiger, Gauvin, and Wonderlich (2007) found that both reported levels of dissociation and negative affect were elevated prior to binge episodes. Statistical analysis indicated that these variables contributed independently to bingeing. No study to the authors' awareness has investigated dissociation and emotion dysregulation within a multiple mediation model of childhood trauma and eating psychopathology. Additionally, only a limited number of studies have investigated childhood emotional neglect (CEN) and childhood physical neglect (CPN) in relation to eating psychopathology despite studies offering some support for a relationship (Gerke et al., 2006; Kong & Bernstein, 2009).

4.3.1 Aims and hypotheses

The present study firstly aims to investigate the full range of experiences of childhood trauma (CEA, CSA, CPA, CEN and CPN) in relation eating psychopathology. Although there are a number of inconsistencies reported within the literature, positive associations have generally been found between CSA, CPA and eating psychopathology. More recent literature indicates that there is perhaps a

stronger association between CEA and eating psychopathology. Therefore it is hypothesised that CSA, CPA and CEA will all be positively associated with eating psychopathology. Less is known about childhood neglect. A limited number of studies have reported positive associations between CEN, CPN and eating psychopathology. Additionally, expanding on the work of Kent and Waller (2000), CEN and CPN may be associated with eating psychopathology due to an emotionally invalidating environment. It is therefore hypothesised that both CEN and CPN would also be positively associated with eating psychopathology.

The main research aim, however, was to investigate whether a history of childhood trauma is indirectly associated with eating psychopathology through mediation by dissociation and/or emotion dysregulation. Both variables appear to be related to eating psychopathology and trauma related distress. Some support has been found for a mediation role for both variables separately. No study to date, however, has investigated these variables together as potential mediators within the same model. Doing so will allow assessment of whether both represent significant mediators or whether one variable better accounts for the link independently. Although research is limited at present, studies investigating both these variables together have indicated that they are related but independent phenomena. It is therefore hypothesised that both dissociation and emotion dysregulation will mediate relationships between the forms of childhood trauma and eating psychopathology.

4.4 Method

4.4.1 Power

The bootstrapping approach to mediation analysis chosen within this study does not require a specific sample size, although, the reliability of the confidence intervals generated generally increases with sample size (Preacher & Hayes, 2004). Guidelines are provided by Fritz and MacKinnon (2007) for estimating required sample sizes necessary for detecting mediation effects. The authors suggest that with a medium effect size, a minimum sample size of at least 71 participants is required in order to achieve a power of .80 for the bias-corrected bootstrapping method.

4.4.2 Participants

Participants were 165 undergraduate Psychology students recruited from the University of Dundee (N = 89) and the University of Stirling (N = 76). 23 participants were male and 142 participants were female. The overall approximate participant uptake rate was 16.6%. Age of participants ranged from 18 to 64 years with a modal age of 19 (M = 21.4; SD = 6.1). 157 (95.2%) of the participants described their marital status as single, 7 (4.2%) as married, and 1 (0.6%) as divorced. Approximate BMI was able to be calculated for all but one of the

participants. Approximate BMI ranged from 16.9 to 37.56 with a modal BMI of 22.5 (M = 23.6; SD = 4.3).

4.4.3 Measures

Demographic Information. Information regarding the participants' gender, age, approximate weight and height, marital status and whether they had ever sought help for anxiety, depression or difficulties with eating was collected through a brief covering sheet.

Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998). The CTQ is a 28-item self-report questionnaire that assesses for a history of childhood sexual, physical and emotional abuse and physical and emotional neglect. Respondents are asked to rate the frequency with which they experienced each of the 28 items during their childhood on a five-point Likert scale from '1' ('never true') through to '5' ('very often true'). Five items are used to assess for each form of childhood trauma with an additional three items making up the minimisation/denial scale. The five items for each form of trauma are totalled to form a total subscale score. Specific cut off scores are given by Bernstein and Fink (1998) resulting in four severity categories for each type of childhood trauma. In the current study internal consistency estimates using Cronbach's alpha were .88 for emotional abuse, .87 for physical abuse, .89 for sexual abuse, .89 for emotional neglect and .78 for physical neglect.

Dissociative Experiences Scale-II (DES-II; Carlson & Putnam, 1993). The DES-II measure is a self-report measure for assessing dissociation in both clinical and nonclinical populations. The DES-II consists of 28 items that assess for the frequency of various daily life experiences of dissociative phenomena. Disturbances in memory, identity, absorption as well as depersonalisation and derealisation are all assessed. Respondents are asked to estimate the percentage of time that the various experiences happen to them in their daily lives on 11-point scale ranging from 0% to 100%, at 10% intervals. The total score is the mean of the 28 items and ranges from 0 to 100. In the current study an internal consistency estimate of .93 was obtained using Cronbach's alpha for the total score.

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). The DERS is a 36-item self-report measure that assesses an individual's difficulty with regulating emotions through adaptive emotion modulation strategies. Respondents are asked to indicate how often the items apply to themselves with responses ranging from '1' ('almost never; 0-10%') to '5' ('almost always; 91-100%'). A total score is derived by summing item scores which reflects the respondent's overall difficulties with regulating emotions. Higher scores indicate greater difficulties with regulating emotion (or emotion dysregulation). The measure also includes six subscales (Nonacceptance; Goals; Impulse; Awareness; Clarity; and Strategies) that reflect the authors' proposed dimensions of emotional regulation. For the purposes of the current study, the total score was used to assess difficulties with regulating emotions. Cronbach's alpha for the total scale score was .95.

Eating Disorders Examination-Questionnaire (EDE-Q; Fairburn & Beglin, 1994).

The EDE-Q is a self-report version of the Eating Disorders Examination (EDE; Fairburn & Cooper, 1993) which is a semi-structured investigator based interview. The EDE-Q consists of 28 items from which a global score and four subscale scores can be derived by summing the item scores. The subscales relate to dietary restraint, eating concern, weight concern and shape concern. Responses are made on a 7-point Likert scale ranging from, '0' ('not at all') to '6' ('markedly'). Respondents are asked to rate each item based on the past four weeks (28 days) with higher scores indicating greater eating psychopathology. For the purposes of the current study, the EDE-Q global scale score was used to assess eating psychopathology. This score represents the mean of the scores on the restraint, eating concern, weight concern and shape concern subscales. Cronbach's alpha for the global scale score was .98.

4.4.4 Procedure

Ethical approval was received from the University of Edinburgh Clinical Psychology Research and Ethics Committee. Participants at universities of Dundee and Stirling received course credit for their participation. Participants at the University of Dundee completed the questionnaires anonymously in groups of 10 to 12 participants. Participants at the University of Stirling collected the questionnaires from the Psychology office and completed the questionnaires on an individual basis and returned the questionnaires in a sealed envelope. In case the content of the questionnaires elicited any distress, all participants at the University of Dundee were

provided with the contact details for a qualified Clinical Psychologist and all participants at the University of Stirling were provided with contact details for a qualified Health Psychologist.

4.4.5 Data Analysis

Missing data analysis revealed that 0.5% of responses to all items were missing and that these responses were missing at random. Therefore, missing values within the dataset were replaced with the individual's mean for the relevant total scale/subscale. One participant did not complete the DES measure, one participant did not complete the EDE-Q and two participants did not complete the CTQ. These participants were all female and were excluded from the analyses involving these variables.

Data were found to be positively skewed across all measures. Bernstein and Putnam (1986) discuss that the DES measure is not normally distributed and recommend the use of non-parametric statistics. Research using the CTQ has also reported positively skewed data with non-parametric tests being utilised (e.g. Uçok & Bikmaz, 2007). It was therefore decided that non-parametric tests would be utilised within the different analyses. In order to explore any potential gender or recruitment site differences across the variables, the Mann–Whitney U-test was used for continuous variables and chi-squared test was used for categorical variables. Spearman's correlation analyses were used to explore relationships between the variables.

Mediation analyses were conducted using models with the two proposed mediators to simultaneously assess dissociation and emotion dysregulation as potential mediators for the effect of the different types of childhood trauma on eating psychopathology. By allowing the assessment of a number of putative mediators, multiple mediation models reduce the likelihood of parameter bias resulting from omitting variables (Preacher & Hayes, 2008). This approach allows different theories to be tested by determining the relative magnitudes of the specific indirect effects associated with the different proposed mediators. Bootstrapping procedures described by Preacher and Hayes (2008) were used to explore the statistical influence of the proposed mediators. Bootstrapping is a non-parametric approach that makes no assumptions about distributions (Hayes, 2009). Bias corrected and accelerated (BCa) confidence intervals were used within these analyses. A detailed technical account of support for using BCa intervals is provided by Efron (1987). In line with (Preacher & Hayes, 2004) recommendations, the indirect effects were investigated using BCa confidence intervals set at 95% with 5000 bootstrap samples. A mediation effect is significant if the upper and lower bounds of the BCa confidence intervals do not contain zero, specifically, the mediation effect is not zero at the set confidence level ($p < .05$).

According to Hayes (2009), if the independent variable (i.e. type of childhood trauma), is shown to be associated with the dependent variable (i.e. eating psychopathology), then mediation is being assessed for. If there is no evidence that the independent variable is associated with the dependent variable, then an indirect

effect is being assessed for. A fuller discussion of this distinction is provided by Mathieu and Taylor (2006). Hayes (2009) recommends that researchers should explore indirect effects as well as mediation effects as two variables may be associated indirectly through other variables. Therefore both mediation and indirect effects were assessed within the analyses. The multiple mediation model is presented in Figure 1.

Previous studies investigating mediation effects between childhood trauma and eating psychopathology within clinical as well as student samples have mainly recruited female participants. It was decided, therefore, that a separate analysis for female participants would be completed to allow better comparison with previous research. Therefore a correlational analysis including female participants only was conducted to explore the associations between the variables. Following this analysis, the mediation/indirect effects between childhood trauma and eating psychopathology were also investigated separately for female participants.

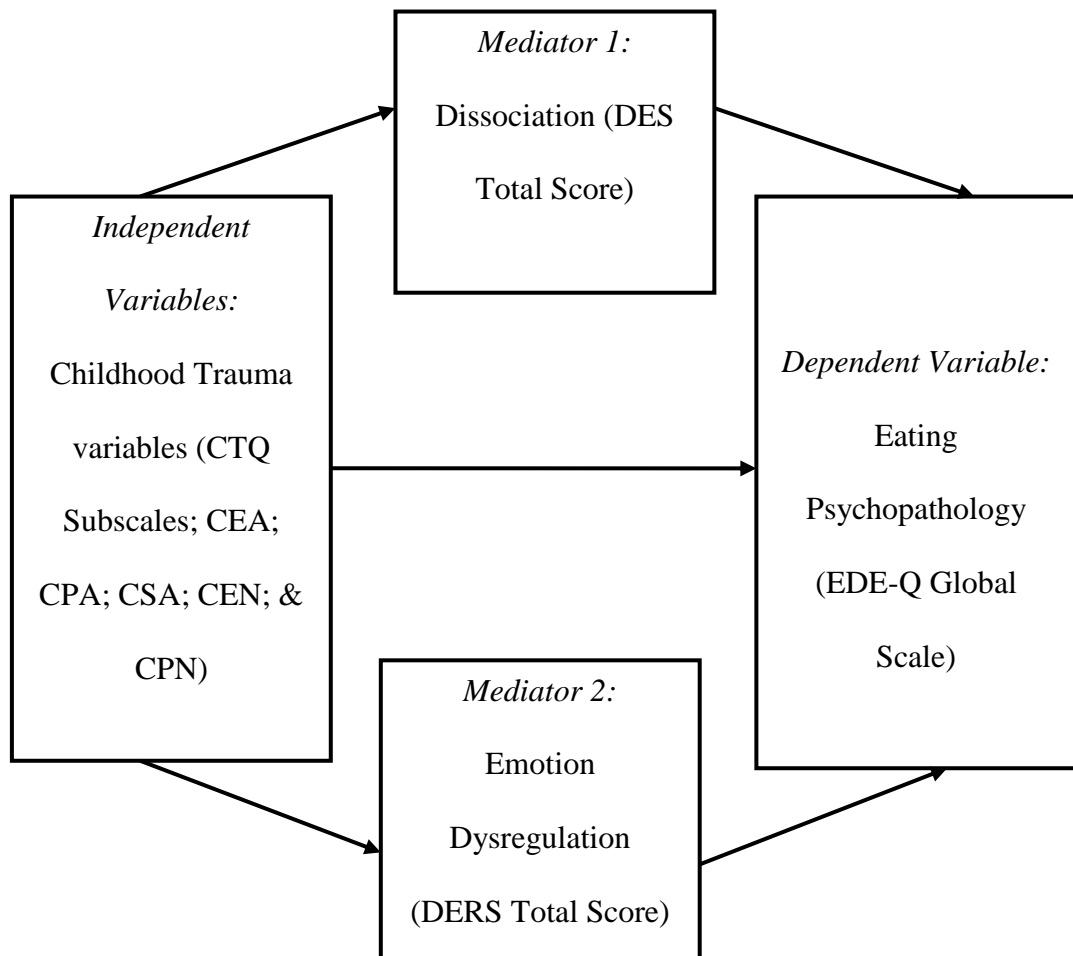


Figure 1. Multiple mediation models assessed within study

4.5 Results

4.5.1 Descriptives

The means, standard deviations and range of scores across the measures are presented in Table 1. Exploration of the variables revealed no significant differences between recruitment sites in terms of age, BMI, gender, marital status, and number of participants indicating they had sought help for anxiety, depression and eating difficulties. No significant differences were observed across the measures for recruitment site. Female participants scored significantly higher than male participants on the EDE-Q global scale, Mann-Whitney = 842.50, $z = -3.69$, $p < 0.001$ and DERS total score, Mann-Whitney = 1050.00, $z = -2.74$, $p = 0.006$. No other significant differences were observed for gender.

Table 1. Mean, standard deviation and range of scores on all measures

<i>Measure</i>	<i>Males</i>	<i>Females</i>	<i>Sample as a whole</i>	
	<i>Mean (SD)</i>	<i>Mean (SD)</i>	<i>Mean (SD)</i>	<i>Range</i>
<i>EDE-Q Global Score</i>	1.0 (0.7)	2.2 (1.4)	2.0 (1.4)	0.0 – 5.7
<i>DES (mean total score)</i>	13.2 (12.5)	15.8 (11.8)	15.5 (11.9)	1.1 - 50.4
<i>DERS Total Score</i>	71.4 (19.2)	87.2 (25.4)	85.0 (25.2)	40 -150
<i>CTQ Emotional Abuse</i>	7.8 (3.1)	8.4 (4.3)	8.4 (4.2)	5 - 25
<i>CTQ Physical Abuse</i>	6.1 (2.7)	6.0 (2.8)	6.0 (2.8)	5 - 25
<i>CTQ Sexual Abuse</i>	5.4 (1.3)	5.7 (2.5)	5.6 (2.4)	5 - 21
<i>CTQ Emotional Neglect</i>	10.4 (4.4)	9.1 (4.3)	9.3 (4.3)	5 - 24
<i>CTQ Physical Neglect</i>	6.9 (3.2)	6.3 (2.4)	6.3 (2.5)	5 - 22

4.5.2 Prevalence of Childhood Trauma

Participants were considered to have a history of childhood trauma if they scored within either of the top two categories on the CTQ subscale as outlined by Bernstein and Fink (1998). Specifically, this included participants classified as experiencing either moderate to severe or severe to extreme childhood trauma. Reported frequencies of each type of childhood trauma are reported in Table 2.

Table 2. Frequencies of reported childhood trauma

<i>CTQ Subscale</i>	<i>Males</i> (<i>N</i> = 23)	<i>Females</i> (<i>N</i> = 140)	<i>Sample as a whole</i> (<i>N</i> = 163)
<i>Emotional Abuse</i>	2 (8.7%)	24 (17.1%)	26 (16%)
<i>Physical Abuse</i>	2 (8.7%)	7 (5%)	9 (5.5%)
<i>Sexual Abuse</i>	1 (4.3%)	10 (7.1%)	11 (6.7%)
<i>Emotional Neglect</i>	4 (17.4%)	17 (12.1%)	21 (13%)
<i>Physical Neglect</i>	3 (13%)	12 (8.6%)	15 (9.2%)

4.5.3 Bivariate Correlations

Correlations among childhood trauma, dissociation, emotion dysregulation, and eating psychopathology are presented in Table 3 for the sample as a whole. Looking at the relationships between eating psychopathology and the different subtypes of childhood trauma revealed that eating psychopathology was positively correlated with both CEA and CEN ($r_s = .22$, $p = 0.005$ and $r_s = .25$, $p = 0.001$ respectively). However, eating psychopathology was not significantly correlated with CPA, CSA or CPN.

Table 3. Bivariate correlations among childhood trauma, dissociation, emotion dysregulation, and eating psychopathology for sample as a whole

	<i>CEA</i>	<i>CPA</i>	<i>CSA</i>	<i>CEN</i>	<i>CPN</i>	<i>DES</i>	<i>DERS</i>	<i>EDE-Q</i>
<i>CEA</i>	-	.43**	.36**	.64**	.51**	.29**	.38**	.22**
<i>CPA</i>		-	.20**	.28**	.32**	.17*	.14	.13
<i>CSA</i>			-	.28**	.30**	.16*	.20**	.12
<i>CEN</i>				-	.60**	.27**	.29**	.25**
<i>CPN</i>					-	.19*	.14	.13
<i>DES</i>						-	.57**	.45**
<i>DERS</i>							-	.48**
<i>EDE-Q</i>								-

CEA, childhood emotional abuse; CPA, childhood physical abuse; CSA, childhood sexual abuse; CEN, childhood emotional neglect; CPN, Childhood physical neglect; DES, Dissociative Experiences Scale (mean score); DERS, Difficulties in Emotion Regulation Scale (total score); EDE-Q, Eating Disorders Examination Questionnaire (global scale score); * $p < 0.05$; ** $p < 0.01$

The results of the correlational analysis for female participants only are presented in Table 4. CEA, CPA, CEN and CPN were all positively correlated with eating psychopathology ($r_s = .23$, $p = 0.006$; $r_s = .19$, $p = 0.025$; $r_s = .33$, $p < 0.001$; $r_s = .19$,

$p = 0.027$ respectively). CSA was the only subtype of childhood trauma not to correlate significantly with eating psychopathology ($r_s = .13$, $p = 0.131$).

Table 4. Bivariate correlations among childhood trauma, dissociation, emotion dysregulation, and eating psychopathology for female participants only

	<i>CEA</i>	<i>CPA</i>	<i>CSA</i>	<i>CEN</i>	<i>CPN</i>	<i>DES</i>	<i>DERS</i>	<i>EDE-Q</i>
<i>CEA</i>	-	.44**	.39**	.64**	.50**	.29**	.43**	.23**
<i>CPA</i>		-	.22**	.25**	.27**	.22**	.22**	.19*
<i>CSA</i>			-	.30**	.30**	.17*	.21*	.13
<i>CEN</i>				-	.57**	.32**	.36**	.33**
<i>CPN</i>					-	.26**	.22**	.19*
<i>DES</i>						-	.56**	.49**
<i>DERS</i>							-	.47**
<i>EDE-Q</i>								-

CEA, childhood emotional abuse; CPA, childhood physical abuse; CSA, childhood sexual abuse; CEN, childhood emotional neglect; CPN, Childhood physical neglect; DES, Dissociative Experiences Scale (mean score); DERS, Difficulties in Emotion Regulation Scale (total score); EDE-Q, Eating Disorders Examination Questionnaire (global scale score); * $p < 0.05$; ** $p < 0.01$

4.5.4 Multiple Mediation and Indirect Effect Analysis

4.5.4.1 Mediation/indirect effects within full sample.

As significant associations (see Table 3) were observed between eating psychopathology (dependent variable) and CEA and CEN (independent variables), mediation effects were assessed within the analyses involving these variables. Indirect effects were assessed for by the analyses involving the other subtypes of childhood trauma (CPA, CSA and CPN), as no significant association was observed between these variables and eating psychopathology.

Mediation analysis 1: CEA, dissociation, emotion dysregulation and eating psychopathology.

The results of multiple mediation model testing revealed a 95% BCa bootstrap CI of 0.0075 to 0.0543 for dissociation and a 95% BCa bootstrap CI of 0.0207 to 0.0742 for emotion dysregulation. As neither of the intervals for the two variables include zero, it can be concluded that both dissociation and emotion dysregulation mediate the relationship between CEA and eating psychopathology. The multiple mediation model accounted 31% of the variance in eating psychopathology severity ($R^2 = .31$).

Mediation analysis 2: CEN, dissociation, emotion dysregulation and eating psychopathology.

The results of multiple mediation model testing revealed a 95% BCa bootstrap CI of 0.0059 to 0.0496 for dissociation and a 95% BCa bootstrap CI of 0.0123 to 0.0589 for emotion dysregulation. Again, as neither of the intervals for the two variables

include zero, it can be concluded that both dissociation and emotion dysregulation mediate the relationship between CEN and eating psychopathology. The multiple mediation model accounted 32% of the variance in eating psychopathology severity ($R^2 = .32$).

Indirect effect analyses: CPA, CSA, CPN, dissociation, emotion dysregulation and eating psychopathology.

No significant indirect effects were observed for dissociation or emotion dysregulation between CPA and eating psychopathology, or between CSA and eating psychopathology, or between CPN and eating psychopathology. It can be seen that in Table 5, the 95% BCa bootstrap confidence intervals for both dissociation and difficulties in regulating emotions in each analysis includes a zero, indicating that no significant indirect effects were observed.

Table 5. Mediation/indirect effect analyses BCa confidence intervals

<i>Independent and dependent variables assessed within multiple mediation model</i>	<i>Mediation/Indirect Effects</i>			
	<i>Dissociation</i>		<i>Emotion dysregulation</i>	
	<i>BCa 95% CI</i>		<i>BCa 95% CI</i>	
	<i>Lower</i>	<i>Upper</i>	<i>Lower</i>	<i>Upper</i>
<i>CEA & Eating Psychopathology</i>	0.0075	0.0543	0.0207	0.0742
<i>CPA & Eating Psychopathology</i>	- 0.0068	0.0559	- 0.0141	0.0631
<i>CSA & Eating Psychopathology</i>	- 0.0078	0.0819	0.0000	0.0902
<i>CEN & Eating Psychopathology</i>	0.0059	0.0496	0.0123	0.0589
<i>CPN & Eating Psychopathology</i>	- 0.0018	0.0654	- 0.0654	0.0758

4.5.4.2 Mediation/indirect effects within female sample.

As significant associations (see Table 4.) were observed between eating psychopathology (dependent variable) and CEA, CPA, CEN and CPN (independent variables), mediation effects were assessed for within the analyses involving these variables. Indirect effects were measured for CSA as no significant association was observed between CSA and eating psychopathology.

Mediation analysis 1: CEA, dissociation, emotion dysregulation and eating psychopathology.

The results of multiple mediation model testing revealed a 95% BCa bootstrap CI of 0.0131 to 0.0682 for dissociation and a 95% BCa bootstrap CI of 0.0148 to 0.0719 for difficulties regulating emotions. As neither of the intervals for the two variables include zero, it can be concluded that both dissociation and emotion dysregulation mediate the relationship between CEA and eating psychopathology. The multiple mediation model accounted 32% of the variance in eating psychopathology severity ($R^2 = .32$).

Mediation analysis 2: CPA, dissociation, emotion dysregulation and eating psychopathology.

The results of multiple mediation model testing revealed a 95% BCa bootstrap CI of -0.0048 to 0.0746 for dissociation and a 95% BCa bootstrap CI of -0.0071 to 0.0670 for difficulties regulating emotions. As both of these intervals for the two variables include zero, it can be concluded that neither dissociation nor emotion dysregulation mediate the relationship between CPA and eating psychopathology.

Mediation analysis 3: CEN, dissociation, emotion dysregulation and eating psychopathology.

The results of multiple mediation model testing revealed a 95% BCa bootstrap CI of 0.0129 to 0.0704 for dissociation and a 95% BCa bootstrap CI of 0.0112 to 0.0634 for difficulties regulating emotions. As neither of the intervals for the two variables include zero, it can be concluded that both dissociation and emotion dysregulation

mediate the relationship between CEN and eating psychopathology. The multiple mediation model accounted 34% of the variance in eating psychopathology severity ($R^2 = .34$).

Mediation analysis 4: CPN, dissociation, emotion dysregulation and eating psychopathology.

The results of multiple mediation model testing revealed a 95% BCa bootstrap CI of 0.0099 to 0.0994 for dissociation and a 95% BCa bootstrap CI of 0.0073 to 0.0845 for difficulties regulating emotions. As neither of the intervals for the two variables include zero, it can be concluded that both dissociation and emotion dysregulation mediate the relationship between CPN and eating psychopathology. The multiple mediation model accounted 34% of the variance in eating psychopathology severity ($R^2 = .34$).

Indirect effect analysis: CSA, dissociation, emotion dysregulation and eating psychopathology.

The results of multiple mediation model testing revealed a 95% BCa bootstrap CI of -0.0180 to 0.0917 for dissociation and a 95% BCa bootstrap CI of -0.0020 to 0.0739 for difficulties regulating emotions. As both of these intervals for the two variables include zero, it can be concluded that there is no significant indirect effect for dissociation or emotion dysregulation between the variables of CSA and eating psychopathology.

4.6 Discussion

The development of eating psychopathology in the context of childhood trauma appears to be complex. Studies have tended to focus on one form of childhood trauma (Hund & Espelage, 2006; Wonderlich et al., 2001). A strength of the current study was that multiple forms of trauma were assessed. Assessing a full range of childhood trauma aids our understanding of what forms of trauma are and are not related to eating psychopathology. Additionally, investigators have highlighted the importance of investigating the potential mechanisms by which these forms of trauma may impact on eating psychopathology. As there are likely to be multiple mechanisms (Gerke et al., 2006), assessing a number of theoretically relevant mediators within the same study is important. Furthermore, measures were chosen that were shown to be reliable and valid for the current sample. Childhood trauma was assessed with a standardised measure that was also used to define the forms of trauma assessed. Together these factors should improve this study's replicability as well as comparability to related studies.

This current study provides support for the hypotheses that both CEA and CEN are associated with increased eating psychopathology. These findings were observed for the sample as a whole and for female participants only. For female participants, CPA and CPN were also positively associated with eating psychopathology. CSA was not

significantly associated with eating psychopathology in either the full sample or the female sample. Partial support was also found for the primary hypothesis that the specific forms of childhood trauma would be indirectly associated with eating psychopathology, through mediation by dissociation and emotion dysregulation. In the sample as a whole as well as for female participants only, both dissociation and emotional dysregulation mediated the relationship between CEA, CEN and eating psychopathology. For female participants only, these two variables also mediated the association between CPN and eating psychopathology but not between CPA and eating psychopathology.

This study assessed for indirect effects as well as mediation effects. As discussed in the introduction, inconsistencies are reported within studies investigating a link between childhood trauma and eating psychopathology. It was hoped that investigating indirect effects as well as mediation effects would help to account for some of the inconsistencies (as two variables can be indirectly linked without being significantly associated). Studies have not typically assessed for indirect effects when two variables have not been found to be significantly associated (e.g. Kent et al., 1999). However, no significant indirect effects between any of the trauma variables and eating psychopathology were observed for either dissociation or emotion dysregulation.

The finding that CEA was significantly associated with eating psychopathology is consistent with previous research (Hund & Espelage, 2006; Kennedy, Ip, Samra, &

Gorzalka, 2007; Kent et al., 1999; Kong & Bernstein, 2009). Research investigating CEN in relation to eating psychopathology is limited. Kong and Bernstein (2009) found that CEN was not significantly associated with eating psychopathology within a sample of patients with a diagnosed eating disorder. Gerke et al. (2006), however, did report a significant association within a sample of female students. The current study also found a significant association within a student sample. Therefore differences in sample sources may go some way to explaining the inconsistencies observed here. Nevertheless, according to Kent and Waller (2000) forms of childhood trauma may be linked with eating psychopathology as a consequence of negative emotional states that result for the individual. Significant associations between CEA, CEN and eating psychopathology would appear to fit with this theory. However, Kent and Waller (2000) propose that CEA may be indirectly associated with eating psychopathology through self-esteem. Kennedy et al. (2007), however, did not find support that self-esteem mediated this relationship. This finding suggests that other emotion related mediators such as dissociation and emotion dysregulation may be important. This point is discussed further below. The finding that CSA was not significantly associated with eating psychopathology either directly or indirectly is consistent with previous research (Kennedy et al., 2007; Kent et al., 1999). This finding highlights the continued need to investigate other forms of childhood trauma in addition to CSA.

Differences emerged when analyses considered females only. CPA and CPN were significantly associated with eating psychopathology for female participants only. A

recent study by Gentile et al. (2007) found that CPA was associated with frequency of eating disorder diagnosis for female participants but not for male participants. In accounting for this finding, the authors suggested that gender role expectations about violence may be important with violence towards males perhaps more accepted within society (and therefore more normalised for male victims). Given the consistent findings for CPA in this study, this proposal should be investigated further in future studies. The link between CPA and eating psychopathology, within the current study was not mediated by dissociation or emotion dysregulation suggesting that other mechanisms might be relevant. The link between CPN and eating psychopathology was, however, mediated by both dissociation and emotion dysregulation. This could perhaps represent the emotionally invalidating and intolerable nature of neglectful environments (Egeland, 2009). It is unclear, however, why this finding was not significant in the sample as a whole.

Investigating theoretically relevant mediators linking childhood trauma and eating psychopathology was the primary aim of this study. That dissociation and emotion dysregulation were significant mediators in three of the four associations observed, within the female sample, is consistent with a number of previous studies. The literature investigating dissociation as a mediator, however, offers mixed support. Gerke et al. (2006) found no support for a mediation effect while Kent et al. (1999) found dissociation only mediated between eating psychopathology and CEA. In accounting for these discrepancies, it may be relevant that CEN and CPN were not assessed separately within the Kent et al. (1999) study, with neglectful experiences

forming a single variable. Further, the present study assessed eating psychopathology using a measure encompassing items relevant to both restrictive and bulimic subtypes of eating psychopathology. The study by Gerke et al. (2006), however, assessed bulimic subtype eating psychopathology only. Although employing larger sample sizes than the present study, both studies assessed for mediation using an analysis that has been argued to be underpowered (Preacher & Hayes, 2004). A recent study by Burns et al. (2012) is the only study to the authors' awareness to consider emotion dysregulation as a mediator. Burns et al. also found that emotion dysregulation was a significant mediator between CEA and eating psychopathology. Consistent with the current study, emotion dysregulation did not mediate the relationship between CSA and eating psychopathology or CPA and eating psychopathology. To the authors' awareness no study has considered both dissociation and emotion dysregulation within the same multi-mediational model. The fact that both variables were significant mediators within the same model suggests that both should be considered as relevant risk/maintaining factors for eating psychopathology.

The conclusion that both dissociation and emotion dysregulation are risk/maintaining factors for eating psychopathology following exposure to childhood trauma is consistent with Briere's (2002) self-trauma model discussed in the introduction to this study. In this model, eating psychopathology following exposure to childhood trauma may be accounted for as the individual's means of maintaining internal stability in the face of trauma related suffering such as painful emotions, memories and cognitions. Consistent with this study's findings, the model suggests that, for individuals who have experienced childhood trauma, behaviours such as disordered

eating may serve to numb or distract from emotions or bring about internal states (e.g. dissociation) that allow the individual to avoid experiencing overwhelming emotion.

Despite theoretical links between dissociation and emotion regulation, very little is known regarding the interrelations between these two variables (Briere, 2006; van Dijke et al., 2010). It is possible that dissociation may be a form of emotion regulation (Fox & Power, 2009) and therefore multicollinearity may have existed within this study's model. Alternatively, it has been proposed that dissociative experiences may function as an escape from dysregulated emotions (Haynos & Fruzzetti, 2011) or emotion dysregulation is a risk factor for the development of dissociative symptomatology (Briere, 2006). Field (2005) suggests that a correlation of .80 or larger indicates multicollinearity between two variables. In the present study, the correlation between dissociation and emotion dysregulation fell below this value ($r = .57$). Therefore, the results of the current study are consistent with the hypothesis that the two variables are related but independent psychological phenomena. Further research is required regarding the potentially important interrelations between these two variables.

Although the current study increases our understanding of the relationship between childhood trauma and eating psychopathology, the results of this study have to be considered in light of the study's limitations. Firstly, the study's sample was made up of undergraduate students only which limits the generalisability of the study's current

findings. It is unclear from this study whether these findings would also be observed within the general population or within eating disorder samples. It would therefore be useful to replicate these findings within both community and eating disordered samples. Further, the sample was made up of largely female participants. Male eating psychopathology is increasingly being studied (Lavender & Anderson, 2010).

Although males were included, this study could not assess any differences or associations in relation to male eating psychopathology separately due to the small sample size recruited. The study is also cross-sectional and correlational in design meaning that conclusions about cause and effect mechanisms are limited.

Longitudinal designs are needed to assess the temporal associations between the constructs assessed here. The present study attempted to address this design limitation by assessing the variables within the context of theory using mediation analyses. There is, however, a possibility of retrospective bias due to the study's reliance upon self-report questionnaires to assess distal relationships.

Despite these limitations, the results of this study indicate that a full range of childhood trauma should be assessed for among patients presenting with eating disorders. Further, developmental and trauma related maintaining factors should be assessed. If trauma related factors, such as dissociation and emotion dysregulation, are hypothesised to be serving to maintain the patient's eating disorder, helping the patient to develop more adaptive coping strategies will be important. Failure to address these maintaining factors may impact negatively on patient motivation and limit treatment success (Briere & Scott, 2007). These findings are in line with a

growing research base applying a range of therapeutic techniques including cognitive behavioural therapy, dialectical behaviour therapy and mindfulness based techniques to emotion intolerance and regulation difficulties observed within individuals with eating disorders (Corstorphine, 2006; Telch, Agras, & Linehan, 2001).

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Appendix 1: Author Guidelines for International Journal of Eating Disorders

Submission

To submit your manuscript online, please:

Prepare your manuscript and illustrations in appropriate format, according to the instructions given here.

If you have not already done so, create an account for yourself in the system at the submission site, <http://mc.manuscriptcentral.com/ijed/> by clicking on the "Create an Account" button. To monitor the progress of your manuscript throughout the review process, just log in periodically and check your Author Center.

Please be sure to study the Instructions and Forms given at the site carefully, and then let the system guide you through the submission process. Online help is available to you at all times during the process. You are also able to exit/re-enter at any stage before finally "submitting" your work. All submissions are kept strictly confidential. If you have any questions, do not hesitate to contact us at support@scholarone.com.

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Manuscripts are received by the editorial office with the understanding that they represent original works, have not published previously, and are not under simultaneous review by another publication. If parts of the manuscripts have been presented at a scientific meeting, this should be indicated on the title page.

Manuscripts are evaluated by one to three members of the Editorial Board, or outside reviewers selected by the Editor. Accepted manuscripts become the permanent property of The International Journal of Eating Disorders and cannot be printed elsewhere without prior permission of the publisher.

Preparation of Manuscript

Number all pages of the manuscript except the figures (including title page and abstract) consecutively. Parts of the manuscripts should be arranged in the following sequence:

(1) Title page. (numbered 1) should include the full names, titles, and affiliations of all authors, and an abbreviated title (Running Head) that should not exceed 50 characters, counting letters, spacing, and punctuation. This Running Head should be typed in upper case letters centered at the bottom of the title page. Each page of the manuscript (excluding figures) should be identified by typing the first two or three words of the full title in the upper right-hand corner above the page number.

(2) Abstract. (150-word maximum) should be started on a separate page, numbered 2. Type the word "Abstract" in upper and lower case letters, centered at the top of page 2. Authors of articles submitted to the Journal involving research data or reviews of the literature must now include the following information in the form of a structured abstract, under the headings indicated. The abstract should be typed as a single paragraph on one page: **Objective:** briefly indicate the primary purpose of the article, or major question addressed in the study. **Method:** indicate the sources of data, give brief overview of methodology, or, if review article, how the literature was searched and articles selected for discussion. For research based articles, this section should briefly note study design, how subjects were selected, and major outcome measures. **Results:** summarize the major or key findings. **Conclusion:** indicate main clinical, theoretical, or research applications/implications. The *Journal* will continue to use unstructured abstracts for case reports.

(3) Text. Begin the text on page 3 and be sure to identify each page with the short title typed in the upper right-hand corner above the page number. Type the full title of the manuscript centered at the top, and then begin the text. The full title appears on page 3 only. Indent all paragraphs. While there is no maximum length for article submissions it is advisable that research be conveyed as concisely as possible.

(4) References. Begin on separate page, with the word "References" typed in upper and lower case letters, centered at the top of the page.

(5) Appendixes. Typed each appendix on a separate page labeled "Appendix A, B", etc., in the order in which they are mentioned in the text.

(6) Footnotes. Start on separate page.

(7) Tables. Tables should be double-spaced, including all headings, and should have a descriptive title. If a table extends to another page, so should all titles and headings. Each table should be numbered sequentially in Arabic numerals and begin on a new page. Be sure to explain abbreviations in tables even if they have already been

explained in-text. Consider the tables and figures to be self-contained and independent of the text. They should be interpretable as stand-alone entities.

(8) Figure captions. Start on separate page. Each figure caption should have a brief title that describes the entire figure without citing specific panels, followed by a description of each panel. Figure captions should be included in the submitted manuscript as a separate section. Be sure to explain abbreviations in figures even if they have already been explained in-text. Consider the tables and figures to be self-contained and independent of the text. They should be interpretable as stand-alone entities. Axes for figures must be labeled with appropriate units of measurement and description.

Manuscript Form and Presentation

All manuscripts are subject to copyediting, although it is the primary responsibility of the authors to proofread thoroughly and insure correct spelling and punctuation, completeness and accuracy of references, clarity of expression, thoughtful construction of sentences, and legible appearance prior to the manuscript's submission. Preferred spelling follows *Webster's New Collegiate Dictionary* or *Webster's Third New International Dictionary*. The manuscript should conform to accepted English usage and syntax.

Microsoft Word is the preferred format for the creation of your text and tables (one file with tables on separate pages at the end of your text). Refrain from complex formatting; the Publisher will style your manuscript according to the Journal design specifications. Do not use desktop publishing software such as Aldus PageMaker or Quark XPress.

Use headings to indicate the manuscript's general organization. Do not use a heading for the introduction. In general, manuscripts will contain one of several levels of headings. Centered upper case headings are reserved for Methods, Results, and Discussion sections of the manuscript. Subordinate headings (e.g., the Subjects or Procedure subsection of Methods) are typed flush left, underlined, in upper case and lower case letters. The text begins a new paragraph.

Presenting statistical data in text: For additional detail regarding statistical requirements for the manuscript see [IJED Statistical Formatting Requirements](#). For more detailed background information on statistical analyses and their rationale authors are referred to [IJED Statistical Reporting Guidelines](#).

Referencing in the text. Wiley's Journal Styles Are Now in EndNote ([Wiley's Journal Styles and EndNote](#)). EndNote is a software product that we recommend to our journal authors to help simplify and streamline the research process. Using EndNote's bibliographic management tools, you can search bibliographic databases,

build and organize your reference collection, and then instantly output your bibliography in any Wiley journal style. If you already use EndNote, you can [download the reference style](#) for this journal. To learn more about EndNote, or to purchase your own copy, [click here](#) . If you need assistance using EndNote, contact endnote@isiresearchsoft.com , or visit www.endnote.com/support

Referencing follows the Vancouver method of reference citation. In this system, references are numbered consecutively in the order in which they are first mentioned in the text. Identify each reference in text, tables, and legends by Arabic numbers. All references cited should be listed numerically at the end of the paper. Prepare citations according to the style used in Index Medicus and the International list of periodical title word abbreviations (ISO 833).

All reference citations in the text should appear in the reference list. When there are less than seven authors, each must be listed in the citation. When seven or more authors, list the first six followed by et al. after the name of the sixth author.

Representative examples are as follows:

Journal Article: 1. Endicott J, Spitzer RL. A diagnostic interview: The schedule for affective disorders and schizophrenia. Arch Gen Psychiatry 1978;35:837-844.

Book Chapter: 2. Fairburn CG, Cooper Z. The eating disorders examination (12th ed). In: Fairburn CG, Wilson GT, editors. Binge eating: nature, assessment, and treatment. New York: The Guilford Press, 1993, p. 317-331.

Book: 3. Tudor I. Learner-centeredness as language education. Cambridge: Cambridge University Press; 1996.

Preparation of figures. To ensure the highest quality print production, your figures must be submitted in TIFF format according to the following minimum resolutions:

- 1200 dpi (dots per inch) for black and white line art (simple bar graphs, charts, etc.)
- 300 dpi for halftones (black and white photographs)
- 600 dpi for combination halftones (photographs that also contain line art such as labeling or thin lines)

Vector-based figures (usually created in Adobe Illustrator) should be submitted as EPS. Do not submit figures in the following formats: JPEG, GIF, Word, Excel, Lotus 1-2-3, PowerPoint, PDF.

Graphs must show an appropriate grid scale. Each axis must be labeled with both the quantity measured and the unit of measurement. Color figures must be submitted in a CMYK colorspace. Do not submit files as RGB. All color figures will be reproduced

in full color in the online edition of the journal at no cost to authors. Authors are requested to pay the cost of reproducing color figures in print. Authors are encouraged to submit color illustrations that highlight the text and convey essential scientific information. For best reproduction, bright, clear colors should be used.

Supplementary materials. Supplementary materials will be made available to readers as a link to the corresponding articles on the journal's website.

PROPOSED ADDITIONAL GUIDELINES FOR COPYEDITING OF MANUSCRIPTS FOR INTERNATIONAL JOURNAL OF EATING DISORDERS

The *Journal* Editor and Associate Editors propose additional guidelines for manuscript copyediting in order to enhance consistency in the organization of printed material, and to bring *IJED* style in line with other major scientific publications. The key elements follow.

1. Each structured abstract should consistently use these subheadings (at present, the headings vary somewhat from article to article): Objective, Method, Results, Discussion.
2. Many of our Authors use terms such as “anorexics” or “bulimics” as personal pronouns, referring to groups of individuals by their common diagnosis. Henceforth, these terms should be replaced with more neutral language, as for example: “individuals with anorexia nervosa”, “patients with bulimia nervosa”, or “participants with eating disorders”.
3. In the Methods section, the subheading “Subjects” should now be replaced with the subheading “Participants”, and this term should be used in place of “subjects” throughout the text.
4. Standard rules will continue to govern the use of capitalization in Headings and Subheadings. However, when a minor word in a Heading or Subheading actually has special or unique meaning, the rule should be overridden.
5. When referring to gender, “males and “females” should be used in cases where the study samples include both children (below age 18) and adults; when the participants comprise adults only, the terms “men” and “women” should be used. In articles that refer to children (i.e., below the age of 13), “boys” and “girls” should be used.
6. In articles that refer to genetic material, the names of genes should be spelled out in full the first time they appear in the text, after which an italicized abbreviation can be substituted.

7. The word “data” is plural so text should follow accordingly; for example, “The data show...the data are ... the data were”.
8. When an article references another article that appears in the very same issue of the *Journal*, (such occurrences are most likely in Special Issues), the citation will be updated by the copyeditor (i.e., volume number and pagination will be substituted for “in press”).
9. For information on how to present *p* values and other standard measurements see [IJED Statistical Formatting Requirements](#).
10. The Methods section should include a statement that the research was reviewed and approved by an institutional review board.

OnlineOpen

OnlineOpen is available to authors of primary research articles who wish to make their article available to non-subscribers on publication, or whose funding agency requires grantees to archive the final version of their article. With OnlineOpen, the author, the author's funding agency, or the author's institution pays a fee to ensure that the article is made available to non-subscribers upon publication via Wiley Online Library, as well as deposited in the funding agency's preferred archive. For the full list of terms and conditions, see

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Authors will be supplied with proofs to check the accuracy of typesetting. Authors may be charged for any alterations to the proofs beyond those needed to correct typesetting errors. Proofs must be checked and returned within 48 hours of receipt. A *reprint order* form will be sent to the corresponding author along with the proofs. Those wishing to order reprints must return this form with payment when returning their corrected proof. Reprints are normally shipped 6-8 weeks after publication of the issue in which the item appears.

Appendix 2: Demographics Sheet

Participant Number

Date

Demographic Information

Please complete the below information:

Demographic Information	Answer
Gender:	
Age:	
Approximate Weight:	
Approximate Height:	
Marital Status:	
Have you ever sought help for anxiety, or depression?	<div>YesNo</div> <div>(Please circle)</div>
Have you ever sought help for difficulties with eating?	<div>YesNo</div> <div>(Please circle)</div>

**Appendix 3: Confirmation of Ethical Approval from the University of
Dundee University of Dundee Research Ethics Committee**



[Researcher's address]

24 January 2012

Dear [Researcher],

Thank you for providing a copy of the approval letter from the University of Stirling Department of Psychology Ethics Committee for your research project, 'Childhood experiences, emotions and eating behaviour '.

I am pleased to confirm that the University of Dundee Research Ethics Committee has given reciprocal approval for this project.

This decision is based on the following documents you provided:

1. Ethics Letter (Stirling)
2. Participant Information Sheet Version
3. UOD Ethics Attachment
4. UOD Staff Ethics
5. PARTICIPANT DEBRIEFING SHEET Version 2
6. Consent Form

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Peter Willatts'.

Dr Peter Willatts
Chair, University of Dundee Research Ethics Committee

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**Appendix 4: Confirmation of Ethical Approval from the University of Stirling
Psychology Ethics Committee**



**UNIVERSITY OF
STIRLING**

Division of PSYCHOLOGY

University of Stirling

Stirling FK9 4LA

Scotland

Telephone: +44 (0) 1786 467640

Facsimile: +44 (0) 1786 467641

<http://www.stir.ac.uk/psychology>

24 January, 2012

Dear [Researcher's Name],

This is to inform you that your proposal: "Childhood experiences, emotions and eating behaviour" has been approved by the Psychology Ethics Committee.

Jim Anderson

Chair, Psychology Ethics Committee

Appendix 5: Participant Information Sheet

PARTICIPANT INFORMATION SHEET

Childhood experiences, emotions and eating behaviour

INVITATION TO TAKE PART IN A RESEARCH STUDY

You are being asked to take part in a research study, which will investigate the association between childhood experiences, managing emotions and eating behaviours.

I am [researchers name], a Trainee Clinical Psychologist currently undertaking my Doctorate in Clinical Psychology at The University of Edinburgh and employed by [NHS Health Board]. This research study will form part of my Doctoral Thesis. My Clinical Thesis supervisor is [researcher's clinical supervisor and Health board] and my academic supervisor is [researcher's academic supervisor] (University of Edinburgh). Additional clinical and academic supervision is provided by [university staff member's name and university name].

Before you decide whether or not you wish to participate in this study, I would like to explain why the study is being carried out, and what taking part will involve for you. Please read the following information carefully. If you have any questions please ask me and I will be happy to discuss the study further and provide additional information.

PURPOSE OF THE RESEARCH STUDY

Previous research has linked childhood experiences with the subsequent risk of developing eating problems. Research has not, however, looked at the role of emotion in maintaining eating problems. Therefore further research is required.

This study will involve completing some brief (non-identifiable) demographic information and 4 questionnaires. One questionnaire will ask about childhood experiences, one about eating behaviours and two relate to emotional experiences.

It is hoped this study will advance our understanding of how eating behaviours relate to people's management of their emotions and their experiences as a child. It is hoped that this will help to inform interventions for those people with significant eating difficulties.

TIME COMMITMENT

Completion of this study should take no more than 30 minutes

RISKS

Some questions asked in the questionnaires may give rise to difficult feelings (e.g. in relation to any experiences of abuse, neglect and eating difficulties). If you are concerned that the subject of any of the questionnaires may cause distress, you should not take part in this study.

TERMINATION OF PARTICIPATION

Your participation in this study is voluntary. If you decide to take part, you may withdraw at any time, without giving reason. Equally you may choose not to take part at all. **Your decision to take part or not, and answers to the questionnaires will not influence your position at the University in any way.**

If you decide to withdraw from the study at any point, you will still receive full credits for participation.

CONFIDENTIALITY/ANONYMITY

All data collected will be made anonymous by assigning a participant number to each of the questionnaires before they are handed out. No one will be able to link the data provided to your identity and name. The data will be seen only by the researcher and his supervisors and will not be made available to anyone else. The questionnaires will be kept for 5 years after which time they will be destroyed.

The results of this study will be written up to form part of the researcher's Doctoral Thesis. Additionally it is intended that the results of this study will be submitted to a peer-reviewed journal. No participant will be identifiable within either of these pieces of work.

FOR FURTHER INFORMATION ABOUT THIS RESEARCH STUDY

[Researcher's name] or [university staff member's contact details] will be glad to answer your questions about this study at any time. You may contact them at [email addresses].

Appendix 6: Consent Form

CONSENT FORM

Childhood experiences, emotions and eating behaviour

This study aims to investigate the association between childhood experiences, eating behaviours and managing emotions.

You will be asked to complete some brief (non-identifiable) demographic information and 4 questionnaires. One questionnaire will ask about experiences in childhood, one about eating behaviours and two relate to managing emotions.

Please tick the boxes below to indicate that:

You have read and understood the Participant Information Sheet ☐

You have had an opportunity to ask questions about participating in this study and have had satisfactory answers to any questions that you have asked ☐

You understand that you can withdraw at any time without any academic consequences or loss of course credits ☐

By signing below you are indicating that you have read and understood the Participant Information Sheet, have had an opportunity to ask further questions about the study and that you agree to take part in this research study.

Participant's signature

Date

Participant's name

Signature of person obtaining consent

Date

Name of person obtaining consent

Appendix 7: Participant Debriefing Sheet

PARTICIPANT DEBRIEFING SHEET

Childhood experiences, emotions and eating behaviour

Thank you for taking part in this study. I would like to explain further why the study is being carried out.

AIMS AND OBJECTIVES OF THE RESEARCH STUDY

Building on previous research, this study aims to investigate the proposed link between negative childhood experiences and eating behaviour. Additionally, this study aims to investigate whether an individual's ability to manage their emotions may also have a role in this link.

It is hoped that there will be an opportunity to extend the current research findings to individuals with an eating disorder.

FOR FURTHER INFORMATION ABOUT THIS RESEARCH STUDY

[Researcher's name] or [university staff member's name] will be glad to answer any further questions about this study at any time. You may contact them at [email addresses]

IF THIS STUDY HAS GIVEN RISE TO ANY DIFFICULT FEELINGS

Should this study have given rise to any difficult feelings, the [university name] Student Services offers support and advice on a range of personal issues. Their website is [web address]

The Students Support Advice Team can be contacted at: [full address]. You may also wish to contact your director of studies for support.

[University staff member's name and qualifications (either Clinical Psychologist or Health Psychologist)] can also be contacted at [email address]

Your General Practitioner (GP) can offer a range of support services for any concerns you have about previous abuse, eating habits, body image, or mood.

Additional information and support is available from:

B-eat – Beating Eating Disorders (UK Wide Charity) Helpline: 0845 6341414 (Mon – Fri 10:30 – 20:30, Sat 13:00 -16:30) Email help@b-eat.co.uk <http://www.b-eat.co.uk>

North East Eating Disorders Support Scotland <http://www.needs.scotland.org>

North of Scotland MCN for Eating Disorders
<http://www.eatingdisorder.nhsgrampian.org>

Moodjuice (NHS information and support materials available for a wide range of emotional difficulties) <http://www.moodjuice.scot.nhs.uk/>

Appendix 8: Author Guidelines for Child Abuse & Neglect

GUIDE FOR AUTHORS

INTRODUCTION

Child Abuse and Neglect The International Journal provides an international, multidisciplinary forum on all aspects of child abuse and neglect, with special emphasis on prevention and treatment; the scope extends further to all those aspects of life which either favour or hinder child development. While contributions will primarily be from the fields of psychology, psychiatry, social work, medicine, nursing, law enforcement, legislature, education, and anthropology, the Journal encourages the concerned lay individual and child-oriented advocate organizations to contribute.

Types of contributions

1. Original, Theoretical, and Empirical Contributions (16-20 pages of text):

Include a clear introductory statement of purpose; historical review when desirable; description of method and scope of observations; full presentation of the results; brief comment/discussion on the significance of the findings and any correlation with others in the literature; section on speculation and relevance or implications; summary in brief which may include discussion. Abstracts and references are required.

2. Brief Communications: Shorter articles of 5-7 pages (abstracts and/or references optional).

3. Articles on Clinical Practice: Case studies (but not single cases), commentaries, process and program descriptions, clinical audit and outcome studies, original clinical practice ideas for debate and argument.

4. Invited Reviews: Plans for proposed reviews are invited in draft outline in the first instance. The editors will commission reviews on specific topics. Reviews submitted without invitation or prior approval will be returned.

5. Letters to the Editor: Letters and responses pertaining to articles published in *Child Abuse and Neglect* or on issues relevant to the field, brief and to the point, should be prepared in the same style as other manuscripts.

6. Announcements/Notices: Events of national or international multidisciplinary interests are subject to editorial approval and must be submitted at least 8 months before they are to appear.

Contact details for submission

All correspondence, including notification of the Editor-in-Chief's decision and requests for revision, takes place by e-mail and via the Author's homepage, removing the need for a hard-copy paper trail. For those authors unable to utilize the EES system, or with questions about submissions, please contact the Editorial Office in

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BEFORE YOU BEGIN

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For information on Ethics in publishing and Ethical guidelines for journal publication see <http://www.elsevier.com/publishingethics> and <http://www.elsevier.com/ethicalguidelines>.

Policy and ethics

The work described in your article must have been carried out in accordance with *The Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans*

<http://www.wma.net/en/30publications/10policies/b3/index.html>; *EU Directive 2010/63/EU for animal experiments*

http://ec.europa.eu/environment/chemicals/lab_animals/legislation_en.htm;

Uniform Requirements for manuscripts submitted to Biomedical journals

<http://www.icmje.org>. This must be stated at an appropriate point in the article.

AUTHOR INFORMATION PACK 22 Jun 2012

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All authors are requested to disclose any actual or potential conflict of interest including any financial, personal or other relationships with other people or organizations within three years of beginning the submitted work that could inappropriately influence, or be perceived to influence, their work. See also <http://www.elsevier.com/conflictsofinterest>.

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Submission of an article implies that the work described has not been published previously (except in the form of an abstract or as part of a published lecture or academic thesis or as an electronic preprint, see <http://www.elsevier.com/postingpolicy>), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere including electronically in the same form, in English or in any other language, without the written consent of the copyright-holder.

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